

EVALUATION OF NHTSA MODIFIED
VOLKSWAGEN RABBITS



MDB-TO-CAR SIDE IMPACT TEST OF
A 19⁰ CRABBED MOVING DEFORMABLE BARRIER
TO A 1976 VOLKSWAGEN RABBIT
AT 34.4 MPH

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FINAL REPORT
NOVEMBER 1983

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16. Abstract This test report documents one of a series of twelve crash tests to evaluate the NHTSA's Modified Volkswagen Rabbits. Testing was conducted on a 1976 Volkswagen Rabbit 2-door hatchback with structural modification designated as Optimized at the TRCO Crash Test Facility, East Liberty, Ohio. The test vehicle was impacted on the left side by a moving deformable barrier, crabbed to 19 ⁰ , at 34.4 mph. Occupant responses of two side impact dummies were measured. One dummy was located in the driver's designated seating position and one was located in the left rear seating position. The test date was October 19, 1983 and the ambient temperature was 56 ⁰ F.		
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				

in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km

AREA

in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
acres	acres	0.4	hectares	ha

MASS (weight)

oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons	0.9	metric ton	t

VOLUME

tsp	teaspoons	5	milliliters	ml.
Tbsp	tablespoons	15	milliliters	ml.
in ³	cubic inches	16	milliliters	ml.
fl oz	fluid ounces	30	milliliters	ml.
c	cups	0.24	liters	L
pt	pints	0.47	liters	L
qt	quarts	0.95	liters	L
gal	gallons	3.8	liters	L
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³

TEMPERATURE (exact)

°F	degrees Fahrenheit	5/9 (after subtracting 32)	degrees Celsius	°C
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Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				

mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi

AREA

cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares	2.5	acres	

MASS (weight)

g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	metric ton	1.1	short tons	

VOLUME

ml	milliliters	0.03	fluid ounces	fl oz
ml	milliliters	0.06	cubic inches	in ³
L	liters	2.1	pints	pt
L	liters	1.06	quarts	qt
L	liters	0.26	gallons	gal
m ³	cubic meters	35	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³

TEMPERATURE (exact)

°C	degrees Celsius	9/5 (then add 32)	degrees Fahrenheit	°F
----	-----------------	-------------------	--------------------	----

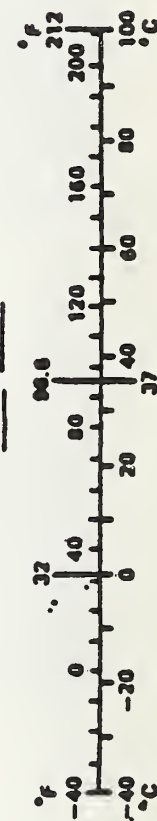
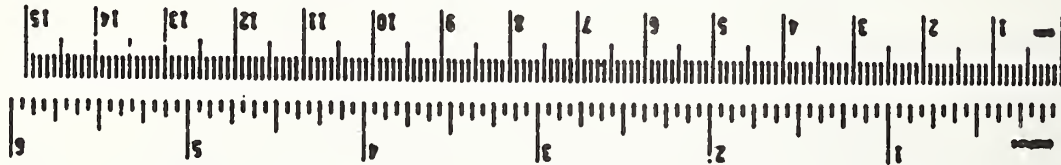


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SECTION 1.0
PURPOSE AND INTRODUCTION

PURPOSE

The main purpose of this test was to evaluate the NHTSA fleet of modified Volkswagen Rabbits with and without padding. The vehicle was tested using conditions not currently contained in a Federal Motor Vehicle Safety Standard.

INTRODUCTION

A stationary 1976 Volkswagen Rabbit 2-door hatchback was impacted on the left side by a Moving Deformable Barrier (MDB) on October 19, 1983. The test was to simulate an intersection collision with the striking vehicle traveling at 26 mph and the struck vehicle traveling at 13 mph. The orientation angle of the striking vehicle was 60° counterclockwise with respect to the longitudinal axis of the struck vehicle. The impact point was to be 37 inches forward of the vehicle center of gravity which is defined by accident investigation to be the midpoint of the wheelbase.

To simulate this collision, the MDB was to be towed into the stationary Volkswagen Rabbit at 34.4 mph with the MDB's wheels crabbed clockwise to 19°. The actual test speed was 34.4 mph and the actual impact point was 38.5 inches forward of the midpoint of the Volkswagen Rabbit's wheelbase.

The vehicle was structurally modified to the level designated "Optimized". The driver door and left rear occupant wall were unpadded.

Section 2 contains General Test and Vehicle Parameter Data. Section 3 contains data required by R & D. Appendix A contains pre-test and post-test vehicle and dummy photographs. Appendix B contains Data Plots. Appendix C contains Dummy Certification Data.

SECTION 2.0
GENERAL TEST AND VEHICLE PARAMETER DATA

The following data sheets and photographs describe the General Test and Vehicle Parameter Data.

TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Volkswagenwerk AG

MAKE/MODEL: Volkswagen Rabbit

VIN: 1763165017

BODY STYLE: 2-Door Hatchback

MODEL YEAR: 1976

NHTSA NO.: R & D

COLOR: Green

ENGINE DATA: TYPE: Transverse

CYLINDERS: 4

DISPLACEMENT 97 CID

TRANSMISSION DATA: 3 Speed Automatic

DATE VEHICLE RECEIVED: 10/3/83

ODOMETER READING: 35741

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	No	AUTOMATIC TRANSMISSION	Yes
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	No
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	No	AIR CONDITIONING	No
RADIO	No	ANTI-SKID BRAKE	No
CLOCK	No	REAR WINDOW DEFROSTER	Yes
OTHER			

REMARKS:

1. IS THE VEHICLE STOCK THROUGHOUT? No - Structurally optimized modification
2. DOES VEHICLE SHOW EVIDENCE OF PRIOR ACCIDENT HISTORY? No
3. DOES VEHICLE SHOW ANY SIGNIFICANT CORROSION? No
4. CONDITION OF THE FRONT/REAR BUMPER AND FRAME: Good

DATA FROM CERTIFICATION LABEL ON LEFT DOOR FACE OR "B" POST:

VEHICLE MANUFACTURED BY: Volkswagenwerk AG

DATE OF MANUFACTURE: 3/76

GVWR: 2777 LBS.,

CAWR: FRONT 1609 LBS., REAR 1276 LBS.

VEHICLE TIRE DATA

RECOMMENDED COLD TIRE PRESSURE: FRONT 27 psi; REAR 27 psi

TIRES ON VEHICLE (MFG. & LINE, SIZE): Front - Uniroyal Rallye 280 - 155SR13
Rear - Uniroyal Rallye 180 - 155SR13

BIAS PLY, BELTED, OR RADIAL: Radial

PLY RATING: 3

IS SPARE TIRE "SPACE SAVER"? No

IS SPARE TIRE STANDARD EQUIPMENT? Yes

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS):

RIGHT FRONT	620	LBS.	RIGHT REAR	350	LBS.
LEFT FRONT	650	LBS.	LEFT REAR	370	LBS.
TOTAL FRONT WEIGHT	1270	LBS.	(63.8 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	720	LBS.	(36.2 % OF TOTAL VEHICLE WEIGHT)		
TOTAL DELIVERED WEIGHT	1990	LBS.			

VEHICLE ATTITUDE (ALL DIMENSIONS IN INCHES):

DELIVERED ATTITUDE:	RF 25 13/16	;LF 25 13/16	;RR 25 7/16	;LR 25 1/8
PRE-TEST ATTITUDE:	RF 24 3/8	;LF 24 3/8	;RR 22 7/8	;LR 22 7/8
POST-TEST ATTITUDE:	RF 22 1/8	;LF 24 7/8	;RR 23 7/8	;LR 24 1/8

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND 147 LBS. CARGO:

RIGHT FRONT	675	LBS.	RIGHT REAR	535	LBS.
LEFT FRONT	745	LBS.	LEFT REAR	530	LBS.
TOTAL FRONT WEIGHT	1420	LBS.	(57.1 % OF TOTAL VEHICLE WEIGHT)		
TOTAL REAR WEIGHT	1065	LBS.	(42.9 % OF TOTAL VEHICLE WEIGHT)		
TOTAL TEST WEIGHT	2485	LBS.			

WEIGHT OF BALLAST SECURED IN VEHICLE TRUNK AREA: 0 LBS.

TEST FLUID DATA

TEST FLUID TYPE: RED STODDARD SOLVENT #2; SPEC. GRAVITY: 0.764

KINEMATIC VISCOSITY: 0.99 CENTISTOKES

"USEABLE" CAPACITY*: 10.5 GALLONS

TEST VOLUME: 3.0 GALLONS

FUEL SYSTEM CAPACITY (DATA FROM OWNERS MANUAL): 10.0 GALLONS

DETAILS OF FUEL SYSTEM: DNA

ELECTRIC FUEL PUMP: No

FUEL INJECTION: No

DOES ELECTRIC FUEL PUMP OPERATE WITH IGNITION SWITCH "ON" AND THE ENGINE NOT OPERATING?

DATA FROM "RECOMMENDED TIRE PRESSURE" LABEL ON DOOR, POST, GLOVEBOX, ETC.

VEHICLE LOAD (UP TO CAPACITY): FRONT 27 psi; REAR 27 psi

RECOMMENDED TIRE SIZE: 155 SR 13 LOAD RANGE X B, C,

VEHICLE CAPACITY: TYPES OF SEATS: Front - Bucket
Rear - Bench

NUMBER OF OCCUPANTS (DESIGNATED SEATING CAPACITY): 2 FRONT
2 REAR
4 TOTAL

CARGO LOAD 142 LBS.

TOTAL 742 LBS.

*WITH ENTIRE FUEL SYSTEM FILLED WITH FUEL TANK THROUGH CARBURETOR BOWL.

TEST CONDITIONS

TEST NUMBER: 831019

DATE OF TEST: October 19, 1983

TIME OF TEST: 13:00

WIND VELOCITY: 4-8 mph 54° NE

HUMIDITY: NA

AMBIENT TEMPERATURE AT IMPACT AREA: 56° F

TEMPERATURE IN OCCUPANT COMPARTMENT: 68° F

SUBJECT VEHICLE DATA

	<u>ACTUAL</u>	<u>INTENDED</u>
VEHICLE TEST WEIGHT (LBS.)	2485	2480
MDB TEST WEIGHT (LBS.)	2990	3000
MDB VELOCITY (MPH)*	34.4	34.4
IMPACT POINT (INCHES)**	38.5	37

DUMMIES

	<u>DRIVER</u>	<u>MIDDLE PASSENGER</u>	<u>RT. FRONT PASSENGER</u>	<u>LEFT REAR PASSENGER</u>	<u>RT. REAR PASSENGER</u>
TYPE:	SID			SID	
SERIAL NO.:	06			UC2	
INSTRUMENTATION:					
HEAD ACCEL.:	Yes			Yes	
CHEST ACCEL.:	Yes (Upper/Lower)			Yes (Upper/Lower)	
FEMUR L.C.'S:	No			No	
OTHER:	Pelvis/Ribs			Pelvis/Ribs	

RESTRAINT SYSTEM: Both dummies were unrestrained

* As measured over final one foot of travel.

** As measured forward of the midpoint of the Volkswagen's wheelbase.

GENERAL TEST AND VEHICLE PARAMETER DATA

VISIBLE DUMMY CONTACT POINTS:

	DRIVER #	PASSENGER #
Head	<u>Side window</u>	<u>Side header, side window</u>
Chest	<u>Side wall</u>	<u>Side wall</u>
Abdomen	<u>Side wall</u>	<u>Side wall</u>
Left Knee	<u>Driver's door panel</u>	<u>Left quarter panel</u>
Right Knee	<u>Left knee</u>	<u>Left knee</u>

DOOR OPENING:

	LEFT	RIGHT
Front	<u>Tools required</u>	<u>Easy</u>
Rear	<u>DNA</u>	<u>DNA</u>

SEAT MOVEMENT:

	SEAT BACK FAILURE	SEAT SHIFT
Front	<u>No</u>	<u>Driver's seat separated</u> from mounts
Rear	<u>No</u>	<u>No</u>

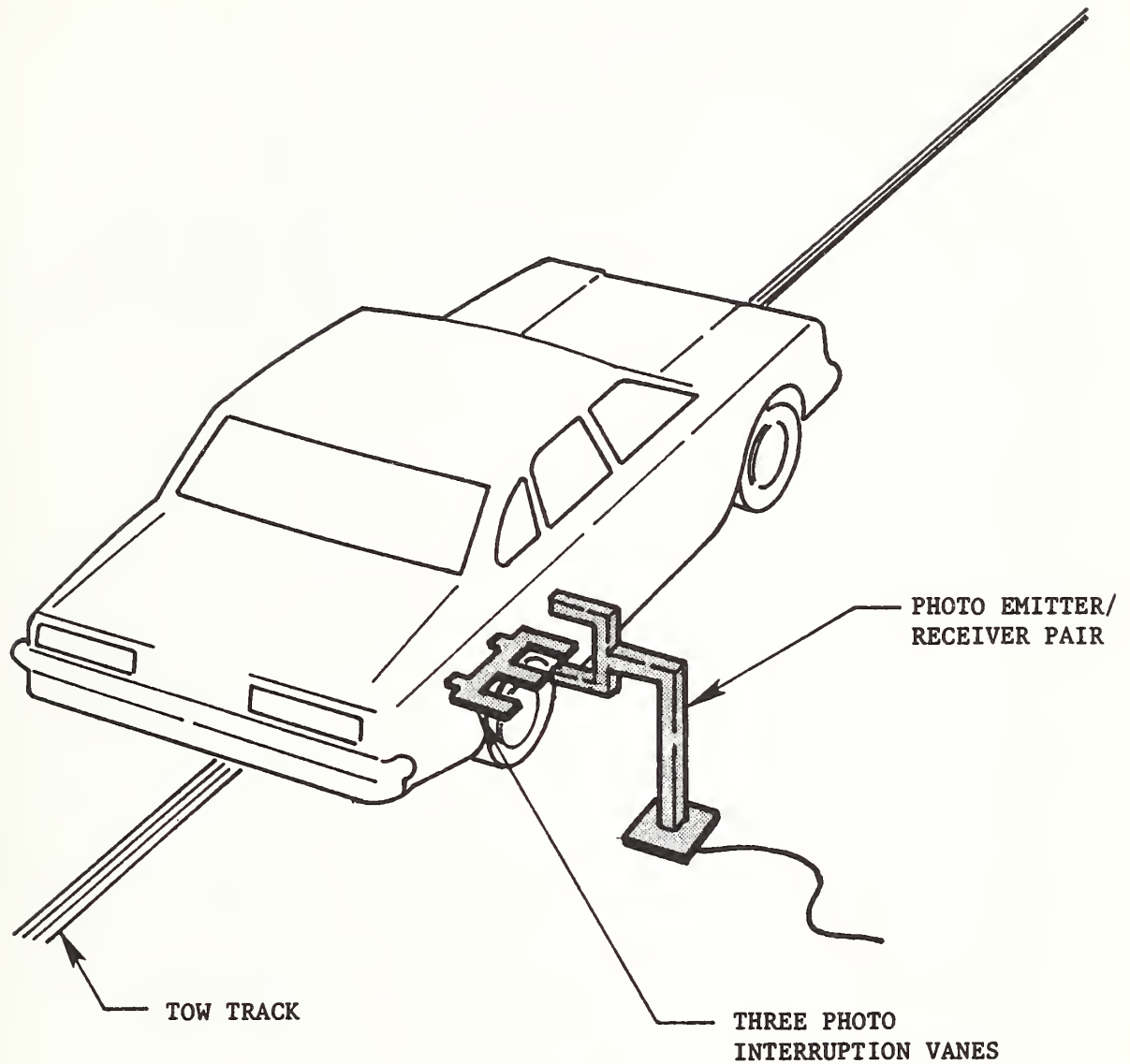
GLAZING DAMAGE:

Left side of windshield cracked, left side
windows separated intact, no backlight damage.

OTHER NOTABLE IMPACT EFFECTS:

Driver's left leg severed at knee.

IMPACT VELOCITY MEASUREMENT SYSTEM



The final vane is located two inches before impact.

The vanes have one foot spacing.

VEHICLE TEST WEIGHT CALCULATION

$$\begin{aligned}\text{Test Weight} &= \text{Unloaded Delivered Weight} + \\ &\quad \text{Number of Dummies} \times 174 \text{ lbs.} + \\ &\quad \text{Cargo Weight} \\ &= 1990 + 2 \times 174 + 142 \text{ lbs.} \\ &= 2480 \text{ lbs.}\end{aligned}$$

To achieve test weight, the exhaust system and battery were removed and 3 gallons of Stoddard Solvent were added in the fuel tank. The weight of the test vehicle was measured by placing each wheel on a Loadmeter Corporation Hiway Loadometer.

SECTION 3.0
DATA REQUIRED BY R&D

The following pages are included in this section:

1. Dummy temperature control and positioning data
2. Dummy kinematic summary
3. Vehicle crush data
4. Dummy and vehicle accelerometer location and data summary
5. High speed camera information
6. Transducer information

DUMMY TEMPERATURE CONTROL AND POSITIONING

The vehicle was kept inside the temperature controlled crash test building until approximately 2 hours prior to the test. Temperature inside the vehicle and ambient temperature at the crash area were recorded. Dummy temperature while outside the crash test building was maintained portably until approximately 1 minute prior to the test.

The following table summarizes the steps taken to position the instrumented, calibrated dummies in the test vehicle.

DUMMY PLACEMENT AND POSITIONING

SIDE IMPACT DUMMY*

DRIVER DSP

HEAD	Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.
UPPER TORSO	Placed against seat back. Midsagittal plane is vertical and centered on bucket seat.
LOWER TORSO	Midsagittal plane is vertical and centered on bucket seat.
UPPER LEGS (thighs or femurs)	Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.
KNEES	Knees set 14.5" apart between pivot bolt head outer surfaces. Outer surface of right knee pivot bolt is 8.6" from midsagittal plane of dummy. Outer surface of left knee pivot bolt is 5.9" from midsagittal plane of dummy.
LOWER LEGS	Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.
RIGHT FOOT	Placed on undepressed accelerator pedal -- rearmost point of heel on floorplan in plane of pedal.
LEFT FOOT **	Placed on toeboard -- rearmost point of heel on floorpan as close as possible to intersection of toeboard and floorpan. Centerline falls in vertical longitudinal plane.

REAR PASSENGER DSP

Surface of transverse instrument mounting platform is as horizontal as possible without inducing torso movement & midsagittal plane falls in longitudinal plane.
Placed against seat back. Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.
Midsagittal plane is vertical and contained in the same longitudinal plane as the driver's midsagittal plane.
Placed against seat cushion. Planes defined by femur and tibia centerlines are as close as possible to vertical.
Located so that planes defined by femur and tibia centerlines are as close as possible to vertical.
Plane defined by femur and tibia centerlines are as close as possible to vertical longitudinal plane.
Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.
Centerline falls in vertical longitudinal plane. Placed on floor as far forward as possible without front seat interference.

*NOTE: THE SIDE IMPACT DUMMY DOES NOT INCLUDE ARMS.

**Due to structural modifications, the left foot was turned inward.

DUMMY IN-VEHICLE POSITION RECORDING SHEET

VEHICLE NHTSA NO. R&D

MFR./MAKE/MODEL: Volkswagen Rabbit

FRONT SEAT TYPE: BENCH
X BUCKET
 SPLIT BENCH

ADJUSTER TYPE: X MANUAL
 POWER

BUCKET SEAT BACK TYPE: FIXED
X ADJUSTABLE

TECHNICIANS:

1. J. Kokoruda
2. M. Garrison
3. N. Echeverria

POSITIONING DATE: 10-19-83

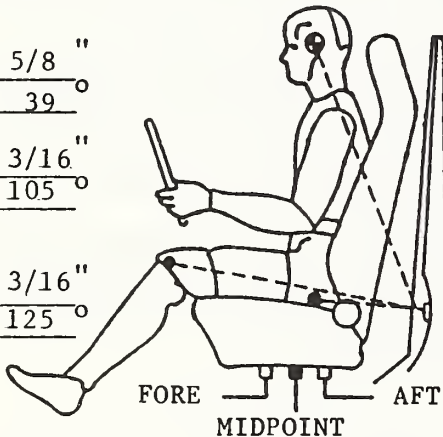
AMBIENT TEMP.: 66° F. TIME: 7:30

DRIVER DUMMY # 06

HEAD 22 5/8 "
 TARGET* 39 °

KNEE 31 3/16 "
 JOINT 105 °

APPROX.
 "H" 18 3/16 "
 POINT 125 °

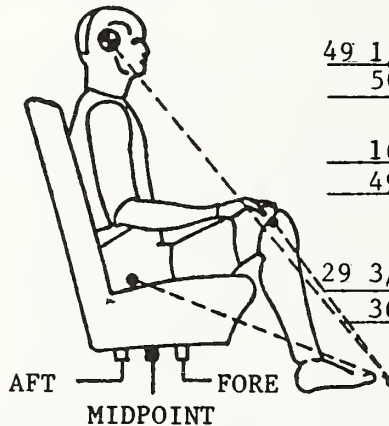


REAR PASSENGER DUMMY # U02

49 1/16 "HEAD
50 °TARGET**

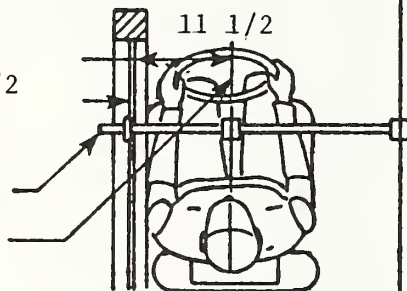
16 "KNEE
49 °JOINT

APPROX.
29 3/8 " "H"
36 °POINT †



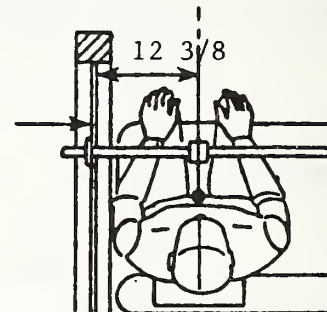
DOOR
 GLASS
 HEIGHT*** 9 1/2

LATERAL BAR
 ADJUSTABLE
 POINTER



DRIVER
 DUMMY # 06

DOOR
 GLASS
 HEIGHT DNA



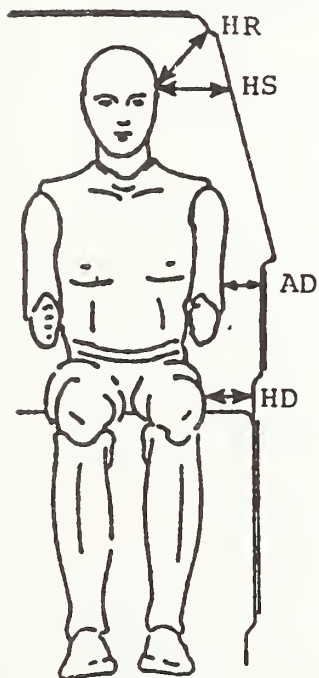
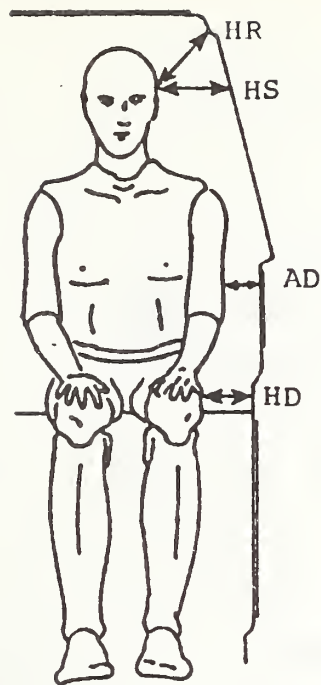
PASSENGER
 DUMMY # U02

*All driver dummy dimensions referenced to top of striker bolt and all angles referenced to vertical.

**All passenger dummy dimensions referenced to front seat back latch bolt with front seat in mid-position and all angles referenced to vertical.

***Door glass height is equal on the right and left side of vehicle at dummy nose level.

† Due to structural modifications interference, the "H" point location was estimated



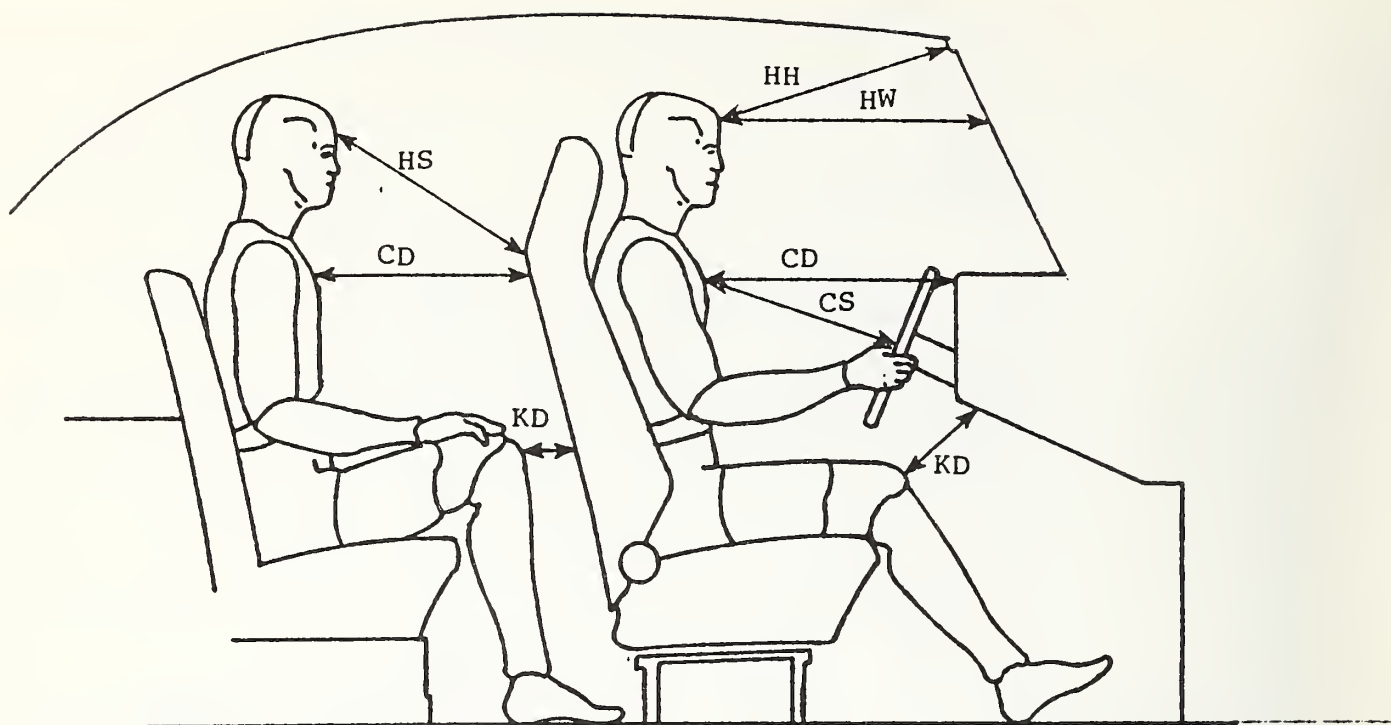
06

U02

	DRIVER	PASSENGER
HR	5 1/16	8 11/16
HS	6 1/4	9 5/8
AD	3 3/4	4 1/2
HD	5 5/8	6 1/4

NOTE: ALL MEASUREMENTS IN INCHES

DUMMY LATERAL CLEARANCE DIMENSIONS



	06	U02
	DRIVER	PASSENGER
HH	12 1/4	DNA
HW	16 3/4	DNA
HS	DNA	25 13/16
CD	20 3/16	19 1/2
CS	11 1/8	DNA
KDL	9 1/4	4 3/8
KDR	9 1/2	3 13/16

NOTE: ALL MEASUREMENTS IN INCHES

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS
3-6

DUMMY KINEMATIC SUMMARY

DRIVER

During impact, the dummy's torso contacted the driver's door and the head contacted the driver's side window. The dummy rebounded across the vehicle and it's buttocks passed through the front passenger's side window. The dummy came to rest laying across the front passenger's seat back with it's buttocks resting on the passenger's window sill.

PASSENGER

During impact, the dummy's torso contacted the left rear occupant side wall and the head contacted the side window and side header. The dummy rebounded across the vehicle with it's feet trapped beneath the driver's seat. It's head and left shoulder contacted the right rear side window sill. The dummy rebounded slowly and eventually came to rest with it's head resting on top of the right rear window sill.

VEHICLE EXTERIOR PROFILES AND STATIC CRUSH
ZERO DISTANCE AT PROJECTED IMPACT POINT*

LOCATION	HEIGHT (in)	6	0	6	12	18	24	30	36	42	48	54	60	66	72	78
		PRE-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)														
Axle Height	9.0	X	X	20.3	20.3	20.3	20.3	20.4	20.4	20.5	20.5	20.6	20.8	20.8	X	X
H-Point	16.0	X	X	18.0	18.1	18.0	18.0	18.1	18.1	18.2	18.3	18.4	18.4	18.5	17.4	X
Mid Door	22.5	16.3	17.8	17.7	17.8	17.8	17.8	17.8	17.8	17.9	17.9	18.0	18.1	18.1	18.3	16.8
Window Sill	33.0	19.9	19.5	19.3	19.3	19.3	19.3	19.3	19.3	19.3	19.4	19.5	19.5	19.6	19.8	19.9
Window Top	51.3	X	X	X	X	X	29.3	27.9	26.8	26.5	26.4	26.4	26.4	26.8	27.3	28.3

POST-TEST PROFILE (DISTANCE IN INCHES FROM REFERENCE PLANE**)

Axle Height	9.0	X	X	21.9	23.8	23.6	23.4	23.3	23.1	22.8	22.6	22.2	21.3	20.9	X	X
H-Point	16.0	X	X	24.9	29.8	31.8	32.9	32.8	31.8	30.1	27.8	25.4	23.4	21.4	18.1	X
Mid Door	22.5	21.1	22.9	23.3	28.2	30.0	31.2	30.6	29.6	28.1	26.6	24.9	22.9	21.3	19.4	16.9
Window Sill	33.0	21.1	21.4	22.1	25.8	28.5	30.4	30.6	28.8	27.0	25.0	24.9	22.8	21.5	20.9	20.6
Window Top	51.3	X	X	X	X	X	31.5	30.1	28.9	28.6	28.6	28.4	28.3	28.4	28.9	29.8

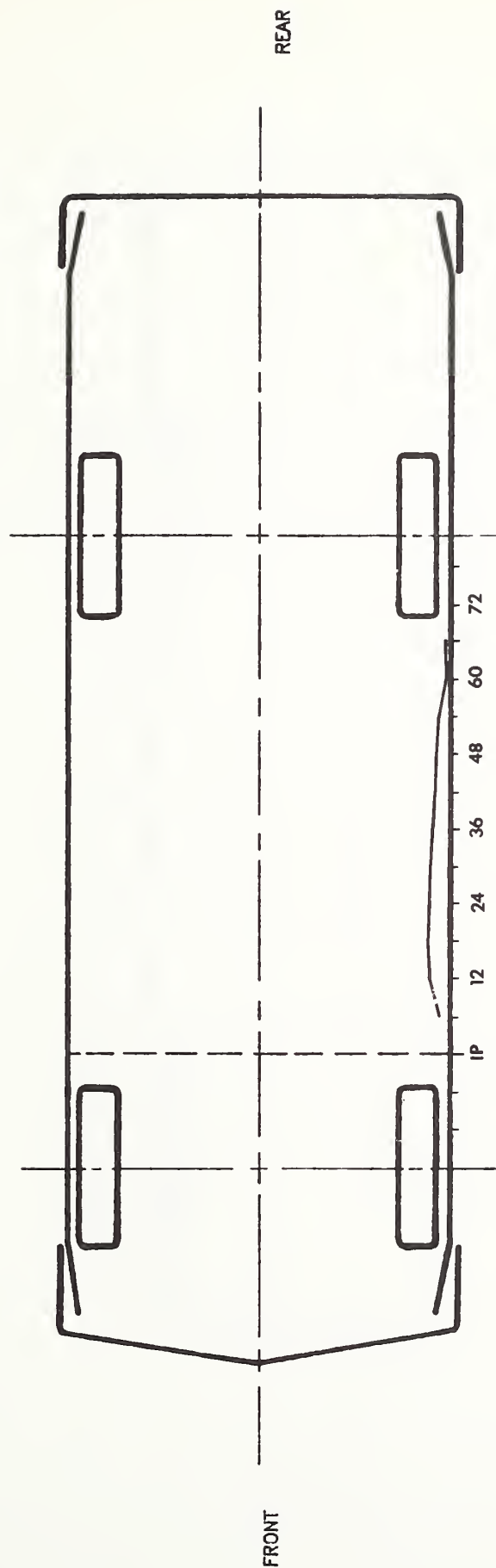
STATIC CRUSH (IN)

Axle Height	9.0	X	X	1.6	3.5	3.3	3.1	2.9	2.7	2.3	2.1	1.6	0.5	0.1	X	X
H-Point	16.0	X	X	6.9	11.7	13.8	14.9	14.7	13.7	11.9	9.5	7.0	5.0	2.9	0.7	X
Mid Door	22.5	4.8	5.1	5.6	10.4	12.2	13.4	12.8	11.8	10.2	8.7	6.9	4.8	3.2	1.1	0.1
Window Sill	33.0	1.2	1.9	2.8	6.5	9.2	11.1	11.3	9.5	7.7	5.6	5.4	3.3	1.9	1.1	0.7
Window Top	51.3	X	X	X	X	X	2.2	2.2	2.1	2.1	2.2	2.0	1.9	1.6	1.6	1.5

* Projected impact point is 37 inches forward of driver's side wheelbase midpoint. Column readings are front to rear from left to right.

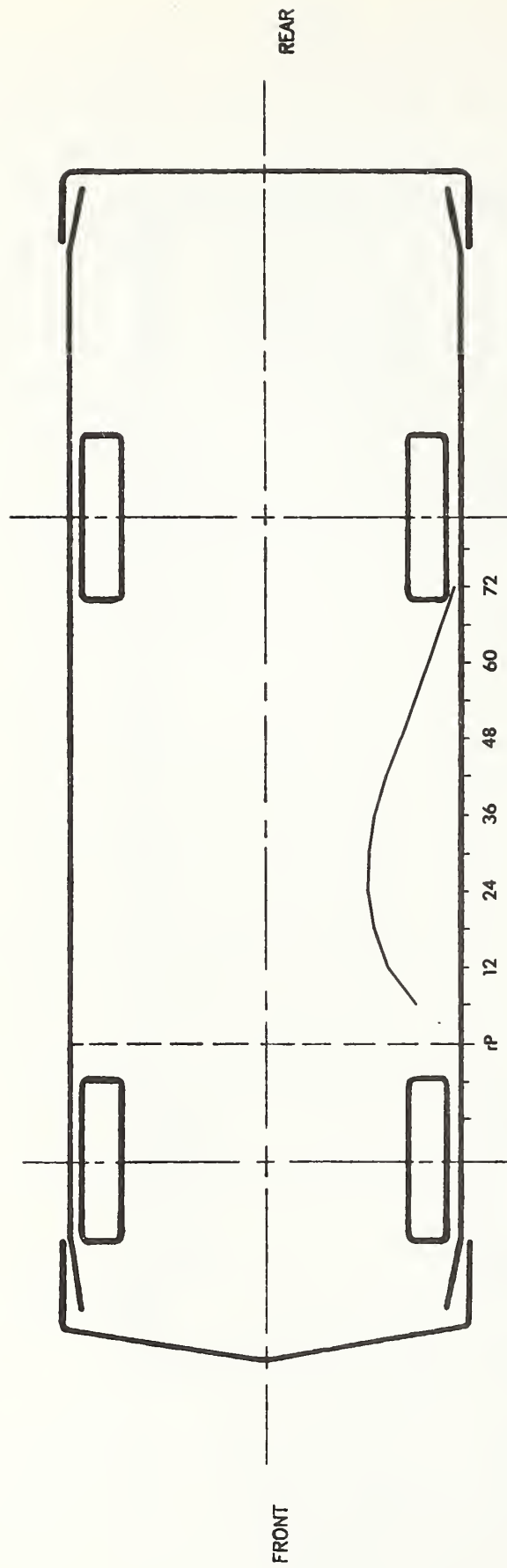
** Reference plane is parallel to and 48 inches from the vehicle longitudinal centerline.

VEHICLE EXTERIOR STATIC CRUSH PROFILE



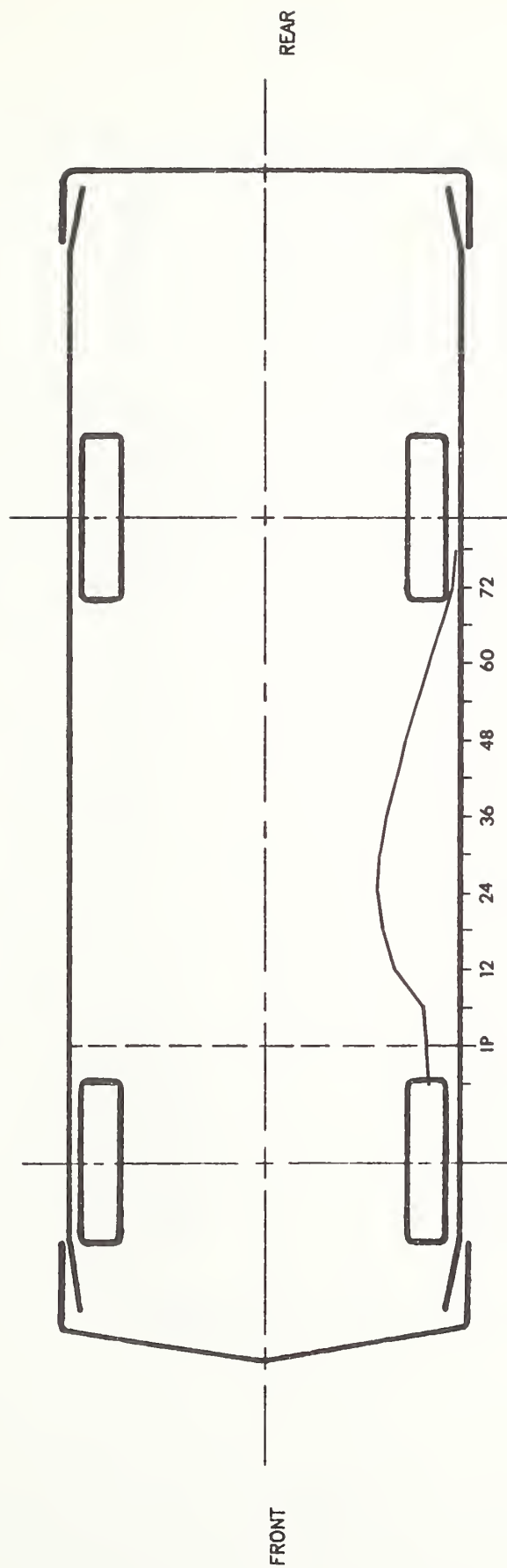
PROFILE LEVEL EQUALS AXLE HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



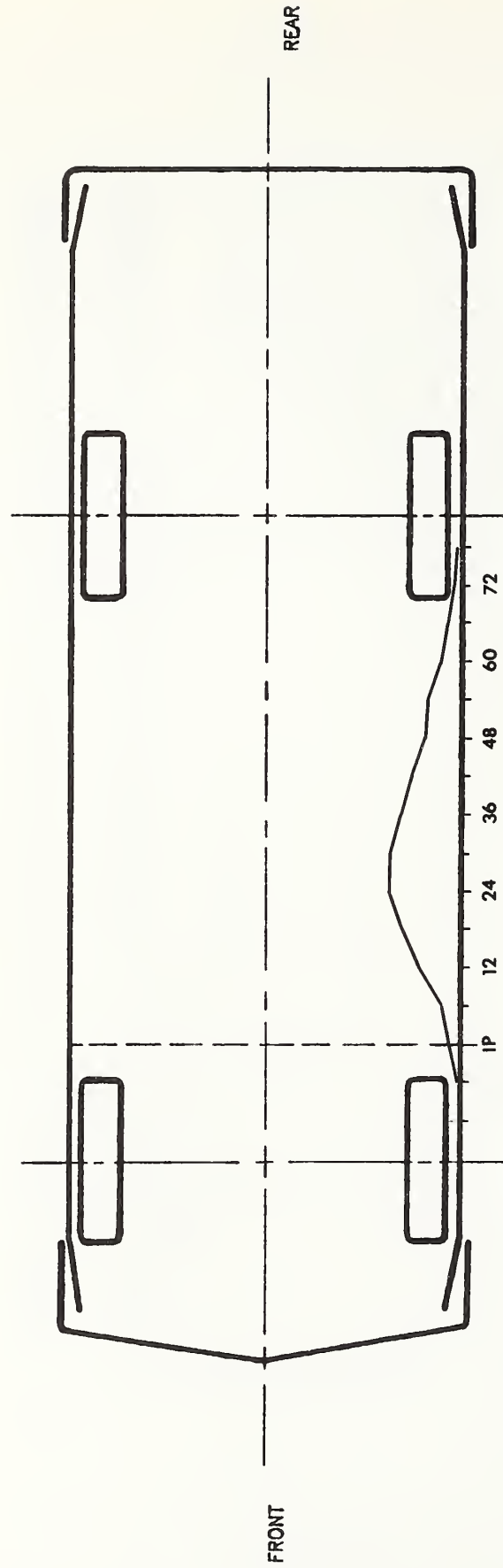
PROFILE LEVEL EQUALS H-POINT HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



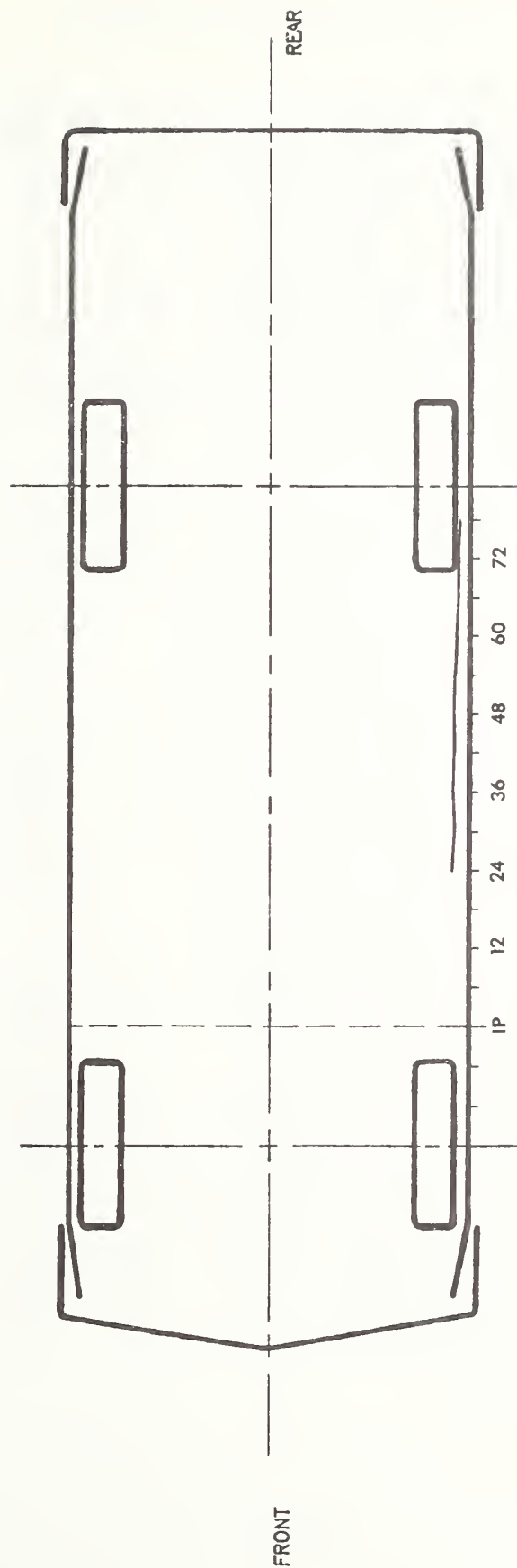
PROFILE LEVEL EQUALS MID-DOOR HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW SILL HEIGHT
IP EQUALS PROJECTED IMPACT POINT

VEHICLE EXTERIOR STATIC CRUSH PROFILE



PROFILE LEVEL EQUALS WINDOW TOP HEIGHT
 IP EQUALS PROJECTED IMPACT POINT

SIDE IMPACT DUMMY DATA SUMMARY

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX	TIME	MAX	TIME	MAX	TIME	MAX	TIME
	(g)	(msec)	(g)	(msec)	(g)	(msec)	(g)	(msec)
HEAD ACCELERATION								
LONGITUDINAL	9.14	66.50	21.02	89.50	12.38	113.13	33.71	86.50
LATERAL	47.57	81.25	14.31	65.00	78.33	86.50	12.39	168.00
VERTICAL	9.22	55.00	62.05	91.00	28.67	118.38	23.95	85.25
RESULTANT		67.15	à 89.88			87.90	à 86.50	
HIC	373.04	from 76.13 to 98.63			283.04	from 83.75 to 91.00		
CHEST ACCELERATION								
UPPER SPINE								
LONGITUDINAL	16.28	77.50	36.20	67.50	3.97	327.50	21.76	118.75
LATERAL (P)***	114.71	68.75	16.85	61.87	45.48	98.12	8.68	143.75
LATERAL (R)***	118.37	68.75	15.48	61.87	46.08	98.12	8.90	143.13
VERTICAL	11.07	53.12	25.71	66.25	8.12	81.25	10.17	121.25
RESULTANT (P)		120.91	à 68.13			48.42	à 98.75	
RESULTANT (R)		124.45	à 68.13			49.12	à 98.75	
DELTA V (MPH)****		21.6	à 84.38 (P)			19.2	à 124.38 (P)	
		22.9	à 84.38 (R)			19.5	à 124.38 (R)	
LOWER SPINE								
LONGITUDINAL	32.14	75.00	21.31	63.75	5.13	221.88	21.58	116.88
LATERAL (P)	105.09	65.63	37.40	87.50	33.93	97.50	8.16	138.13
LATERAL (R)	107.86	65.63	36.77	88.13	33.89	97.50	7.76	136.88
VERTICAL	15.34	70.63	6.59	103.13	8.51	95.63	7.41	121.25
RESULTANT (P)		106.47	à 65.63			35.72	à 96.88	
RESULTANT (R)		109.20	à 65.63			35.59	à 97.50	
DELTA V (MPH)		31.6	à 80.63 (P)			19.1	à 121.25 (P)	
		32.4	à 80.63 (R)			19.5	à 121.87 (R)	
LEFT UPPER RIB								
LATERAL (P)	143.32	63.13	11.78	68.13	50.58	103.13	11.32	169.38
LATERAL (R)	126.99	63.13	10.84	108.75	49.55	103.13	13.04	170.00
DELTA V (MPH)		25.7	à 98.13 (P)			22.0	à 181.25 (P)	
		24.8	à 99.38 (R)			22.0	à 180.62 (R)	
LEFT LOWER RIB								
LATERAL (P)	172.87	61.25	28.29	86.88	65.56	104.38	14.86	170.63
LATERAL (R)	158.98	61.25	30.03	86.88	65.96	104.38	15.04	98.75
DELTA V (MPH)		28.2	à 83.75 (P)			22.6	à 189.38 (P)	
		29.2	à 83.75 (R)			21.8	à 188.75 (R)	
PELVIS ACCELERATION								
LONGITUDINAL	10.70	66.50	46.23	60.13	5.70	137.88	72.33	67.38
LATERAL	137.82	52.88	16.51	45.13	45.61	94.25	28.47	66.88
VERTICAL	33.71	65.63	21.14	67.88	11.99	75.38	7.95	72.88
RESULTANT		139.46	à 52.88			76.58	à 67.38	
DELTA V (MPH)		30.0	à 138.63			20.1	à 142.13	

SIDE IMPACT DUMMY DATA SUMMARY CONTD

	DRIVER DUMMY				PASSENGER DUMMY			
	POSITIVE		NEGATIVE		POSITIVE		NEGATIVE	
	DIRECTION*		DIRECTION**		DIRECTION*		DIRECTION**	
	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)	MAX (in)	TIME (msec)
RIB DEFLECTION †	0.10	267.88	1.80	127.75	0.06	168.50	1.60	119.25

* LONGITUDINAL: FORWARD
 LATERAL: RIGHTWARD
 VERTICAL: UPWARD

**LONGITUDINAL: REARWARD
 LATERAL: LEFTWARD
 VERTICAL: DOWNWARD

*** (P) = Primary Sensor, (R) = Redundant Sensor

**** For dummy channels, Delta V is the velocity change at the approximate time of separation from the contact area.

† Compression: Negative

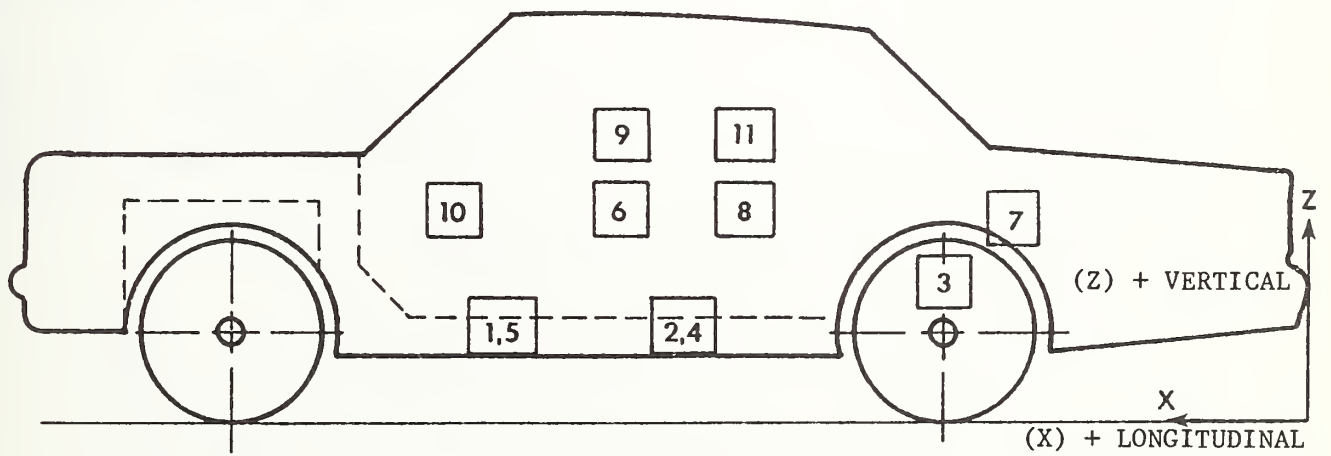
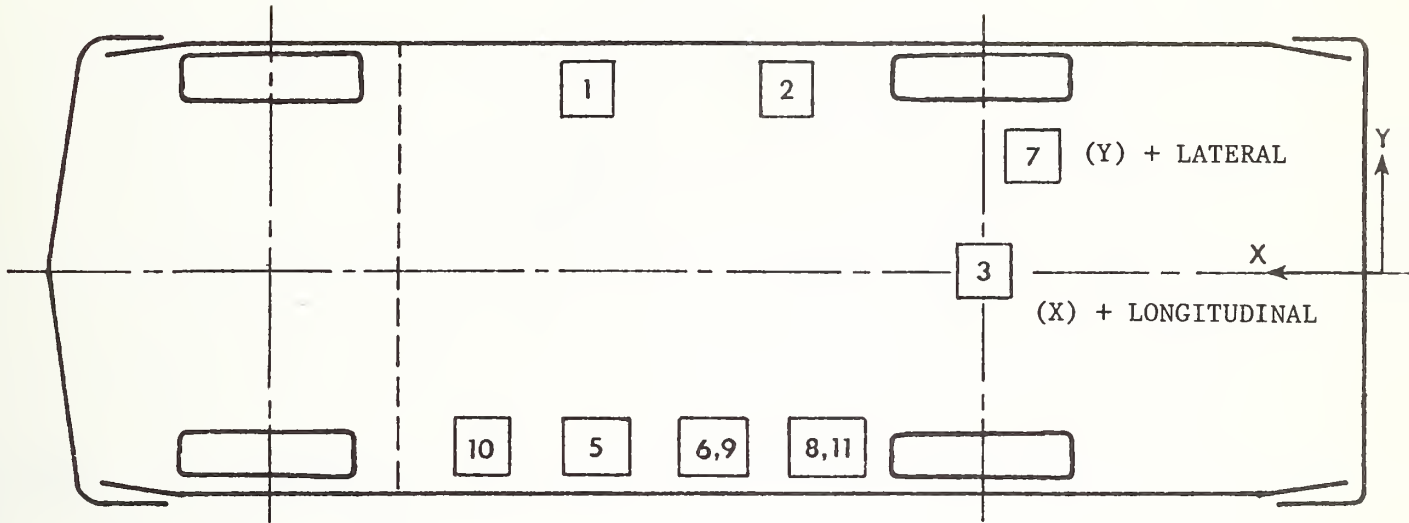
VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	RIGHT SILL AT FRONT SEAT (LONGITUDINAL)	83.3	23.0	9.5				
	(LATERAL)	$\Delta V = -7.7$ mph à 130.00 msec			1.34	144.13	7.95	18.25
	(VERTICAL)	$\Delta V = 12.6$ mph à 130.00 msec			13.08	61.00	3.73	143.25
	(RESULTANT)				6.12	18.00	4.25	38.63
						14.85 à 16.13		
2	RIGHT SILL AT REAR SEAT (LONGITUDINAL)	61.3	23.5	8.0				
	(LATERAL)	$\Delta V = -6.4$ mph à 130.00 msec			1.49	145.75	8.37	18.25
	(VERTICAL)	$\Delta V = 16.3$ mph à 130.00 msec			14.61	90.38	3.58	144.00
	(RESULTANT)				3.34	101.63	4.22	37.75
						15.02 à 90.25		
3	REAR DECK OVER AXLE (LONGITUDINAL)	32.0	0.0	6.6				
	(LATERAL)	$\Delta V = -7.7$ mph à 130.00 msec			4.78	34.25	10.39	66.00
	(VERTICAL)	$\Delta V = 20.3$ mph à 130.00 msec			19.28	92.38	4.03	159.25
	(RESULTANT)				4.54	106.38	6.73	94.75
						22.28 à 93.50		
4	LEFT SILL AT REAR SEAT (LATERAL)	61.0	-23.0	8.6				
		$\Delta V = 13.8$ mph à 130.00 msec			13.11	75.38	5.82	144.88
5	LEFT SILL AT FRONT SEAT (LATERAL)	83.6	-23.5	9.3				
		$\Delta V = 4.8$ mph à 130.00 msec			39.77	33.00	46.03	43.00
6	LEFT FRONT DOOR CENTERLINE (LATERAL)	81.0	-25.4	23.1				
		$\Delta V = 21.5$ mph à 36.25 msec			119.60	34.38	63.70	45.50
7	RIGHT REAR COMPARTMENT (LONGITUDINAL)	31.0	15.4	13.9				
					2.16	147.25	9.27	18.38
8	MIDREAR OF LEFT FRONT DOOR (LATERAL)	60.8	-25.5	23.4				
		$\Delta V = 28.7$ mph à 71.88 msec			123.05	60.50	64.23	84.63
9	UPPER LEFT FRONT DOOR CENTERLINE (LATERAL)	81.8	-26.0	32.2				
		$\Delta V = 24.5$ mph à 46.88 msec			73.45	61.25	89.28	54.13
10	MIDFRONT OF LEFT FRONT DOOR (LATERAL)	99.5	-25.5	21.8				
		$\Delta V = 21.8$ mph à 29.38 msec			84.80	28.25	44.24	40.13
11	UPPER REAR OF LEFT FRONT DOOR (LATERAL)	70.7	-25.5	32.2				
		$\Delta V = 23.3$ mph à 79.63 msec			117.86	48.75	115.86	54.38

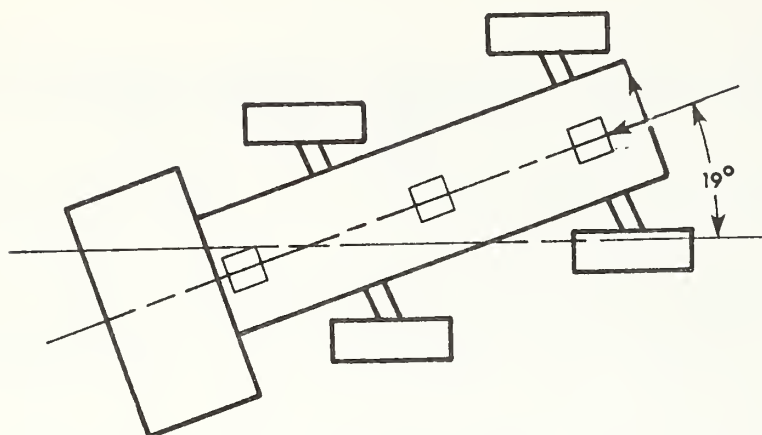
* Reference: X - Rear Bumper (+ Forward), Y - Vehicle Centerline (+ To Right),
Z - Ground Level (+ Up)

All measurements of accelerometer locations in inches.

VEHICLE ACCELEROMETER LOCATIONS



MOVING BARRIER ACCELEROMETER LOCATIONS AND DATA SUMMARY



NO.	LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
					MAX (g)	TIME (msec)	MAX (g)	TIME (msec)
1	CENTER OF GRAVITY	74.5	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -15.1 \text{ mph @ } 130.00 \text{ msec}$			0.92	193.88	10.20	70.38
	(LATERAL)	$\Delta V = -1.7 \text{ mph @ } 130.00 \text{ msec}$			1.34	86.88	3.04	97.25
	(VERTICAL)				11.96	70.50	11.38	78.75
	(RESULTANT)					15.77 @ 70.50		
2	FRONT FRAME MEMBER	130.3	0.0	11.3				
	(LONGITUDINAL)	$\Delta V = -16.0 \text{ mph @ } 130.00 \text{ msec}$			1.42	2.13	10.22	71.75
3	REAR FRAME MEMBER	23.3	0.0	11.5				
	(LONGITUDINAL)	$\Delta V = -14.3 \text{ mph @ } 130.00 \text{ msec}$			1.36	150.00	9.94	70.88

* Reference: X - Rear Most Point of Frame (+ To Forward), Y - Barrier Centerline (+ To Right), Z - Ground Level (+ To Up)

All measurements of accelerometer locations in inches.

HIGH SPEED CAMERA INFORMATION

CAMERA NO.	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Overhead	Photosonics 1B	8	745	Vehicle Dynamics
2	Overhead	Photosonics 1B	25	750	Close-up of impact point
3	Onboard MDB	Photosonics 1B	25	505	Close-up of impact point
4	Onboard MDB	Stalex	13	1000	Driver kinematics
5	Ground level - right	Hycam	25	777	Overall view
6	Ground level - left	Photosonics 1B	17	797	Overall view
7	Onboard vehicle	Photosonics 1B	8	802	Driver kinematics - front view
8	Onboard vehicle	Photosonics 1B	8	812	Driver kinematics
9	Onboard vehicle	Photosonics 1B	8	797	Passenger kinematics

NOTE: CAMERAS ARE NUMBERED ACCORDING TO SPLICING SEQUENCE OF FILM.
 (24 fps) REAL TIME MOVIE FILM COVERAGE OF PRE-CRASH, POST-CRASH
 AND CRASH EVENT SPLICED AT START AND END OF FILM.

LOCATIONS OF OFFBOARD HIGH SPEED CAMERAS

CAMERA NO.	X	Y	Z
1	0	0	25'
2	0	0	25'
5	26'4"	60'	45"
6	-19'7"	-11'3"	45"

Origin of Coordinate System is Point of Impact

+X = Forward with Respect to Striking Vehicle's Velocity Vector
+Y = Rightward with Respect to Striking Vehicle's Velocity Vector
+Z = Upward with Respect to Striking Vehicle's Velocity Vector

NON-GOVERNMENT FURNISHED TRANSDUCER INFORMATION

PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NUMBER	SERIAL NUMBER	MFGR.	DATE OF LAST CALIBRATION	SENSITIVITY	DESIRED FULL SCALE (ENGR. UNITS)
BOGXG	Accel	4-202-0001	18845	Bell Howell	8/9/83	.236 MV/G	50 G
BOGYG	Accel	4-202-0001	18858	Bell Howell	8/9/83	.2385 MV/G	50 G
BOGZG	Accel	4-202-0001	18857	Bell Howell	8/9/83	.2385 MV/G	50 G
BFCXG	Accel	4-202-0001	18240	Bell Howell	8/9/83	.2385 MV/G	50 G
BRCXG	Accel	4-202-0001	19022	Bell Howell	8/9/83	.221 MV/G	50 G

All dummy and struck vehicle accelerometers were Government Furnished Equipment and were Endevco 2264 Accelerometers.

APPENDIX A
PHOTOGRAPHS



Figure A-1. PRE-TEST OVERALL - VIEW 1



Figure A-2. PRE-TEST OVERALL - VIEW 2

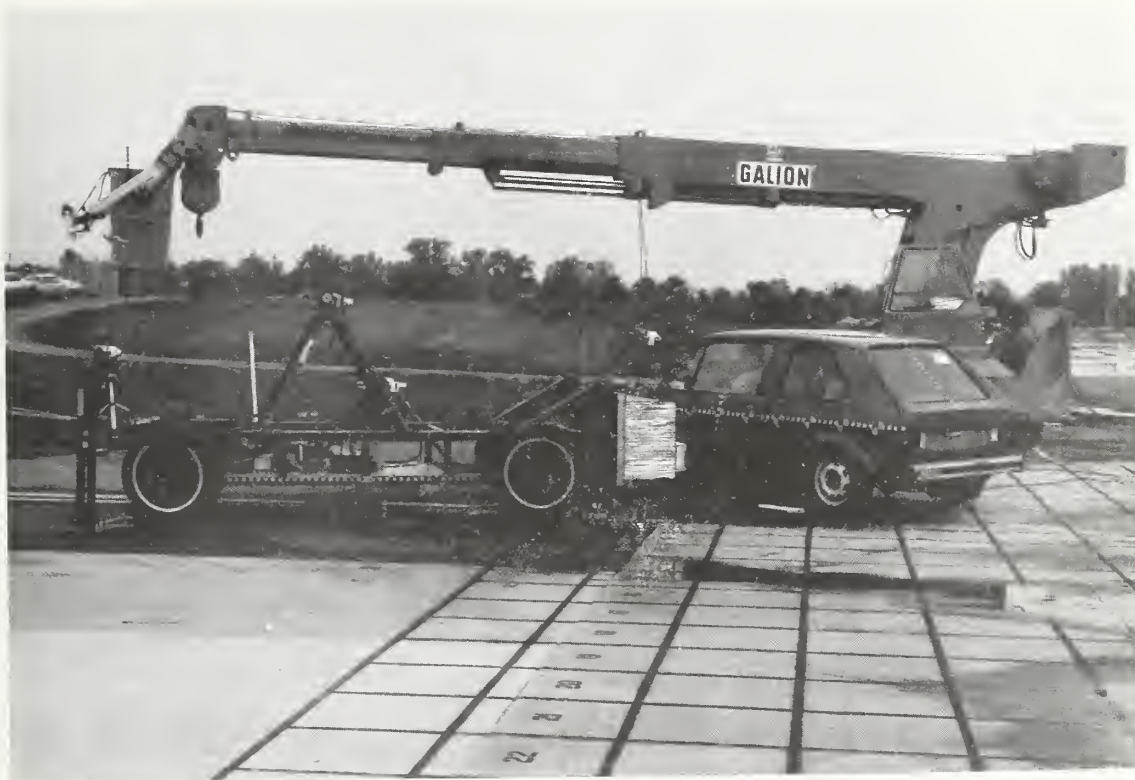


Figure A-3. PRE-TEST OVERALL - VIEW 3



Figure A-4. PRE-TEST OVERALL - VIEW 4



Figure A-5. PRE-TEST CLOSEUP - VIEW 1



Figure A-6. PRE-TEST CLOSEUP - VIEW 2



Figure A-7. PRE-TEST CLOSEUP - VIEW 3



Figure A-8. PRE-TEST DRIVER DUMMY - VIEW 1



Figure A-9. PRE-TEST DRIVER DUMMY - VIEW 2



Figure A-10. PRE-TEST PASSENGER DUMMY - VIEW 1



Figure A-11. PRE-TEST PASSENGER DUMMY - VIEW 2

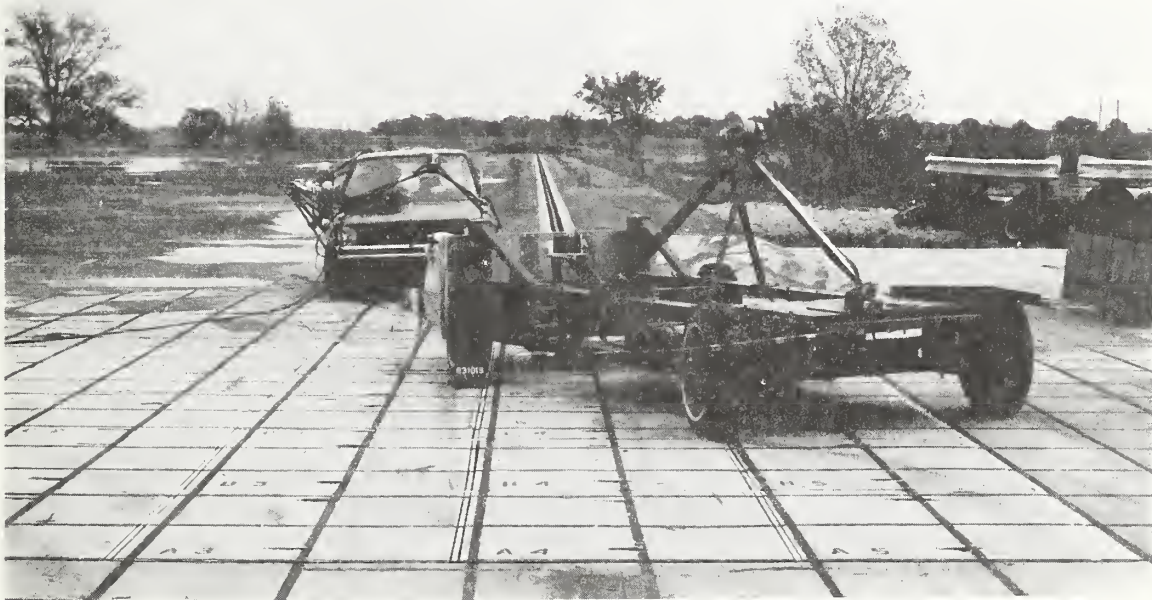


Figure A-12. POST-TEST OVERALL - VIEW 1



Figure A-9. PRE-TEST DRIVER DUMMY - VIEW 2



Figure A-10. PRE-TEST PASSENGER DUMMY - VIEW 1



Figure A-11. PRE-TEST PASSENGER DUMMY - VIEW 2



Figure A-12. POST-TEST OVERALL - VIEW 1



Figure A-13. POST-TEST OVERALL - VIEW 2



Figure A-14. POST-TEST OVERALL - VIEW 3



Figure A-15. POST-TEST OVERALL - VIEW 4



Figure A-16. POST-TEST CLOSEUP - VIEW 1



Figure A-17. POST-TEST DRIVER DUMMY - VIEW 1

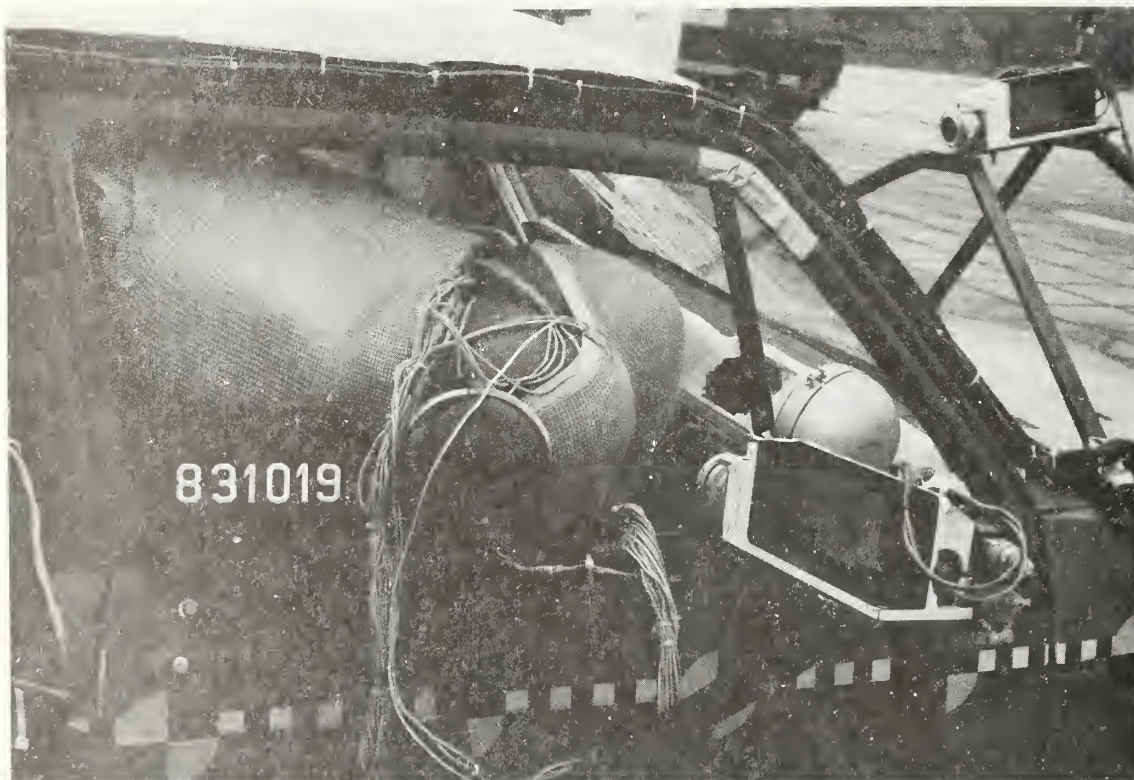


Figure A-18. POST-TEST DRIVER DUMMY - VIEW 2



Figure A-19. POST-TEST DRIVER DUMMY - VIEW 3



Figure A-20. POST-TEST PASSENGER DUMMY - VIEW 1

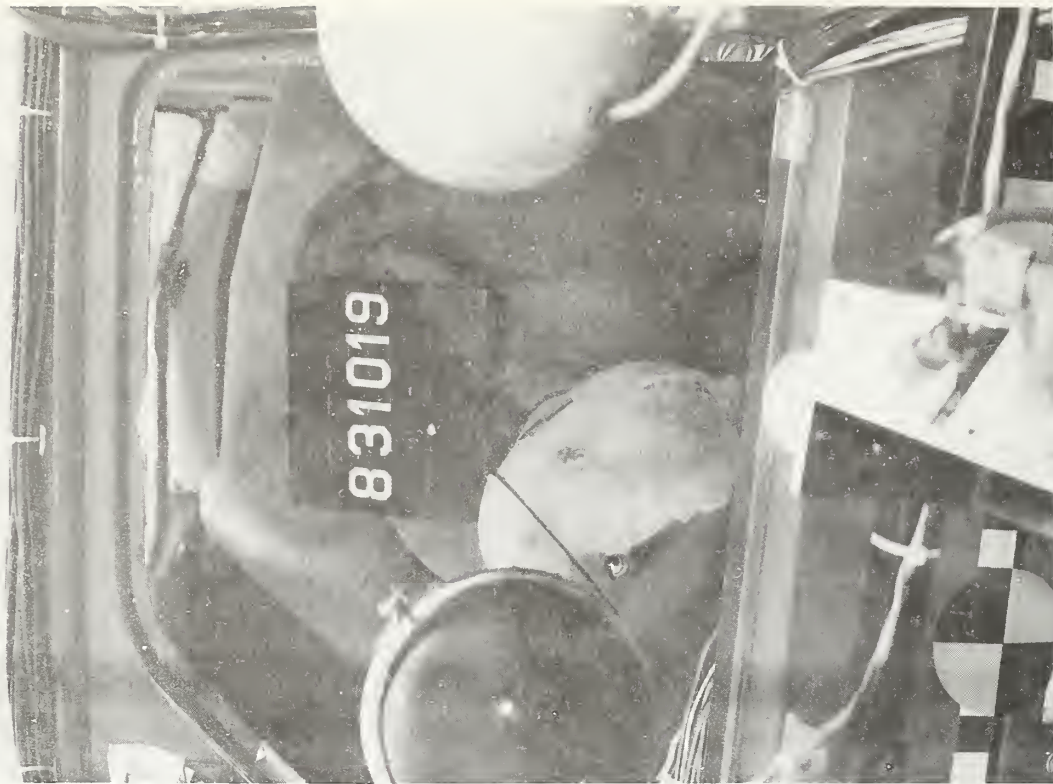


Figure A-21. POST-TEST PASSENGER DUMMY - VIEW 2



Figure A-22. POST-TEST PASSENGER DUMMY - VIEW 3

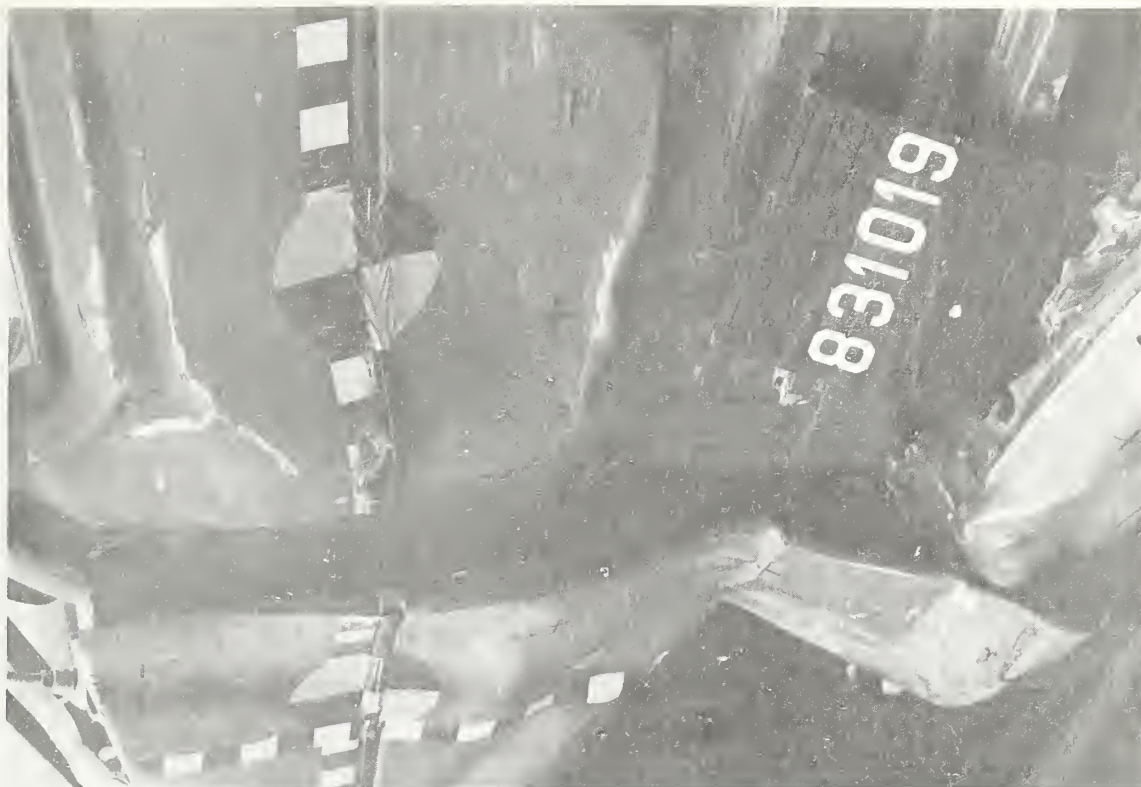


Figure A-23. POST-TEST VEHICLE DAMAGE - VIEW 1



Figure A-24. POST-TEST VEHICLE DAMAGE - VIEW 2

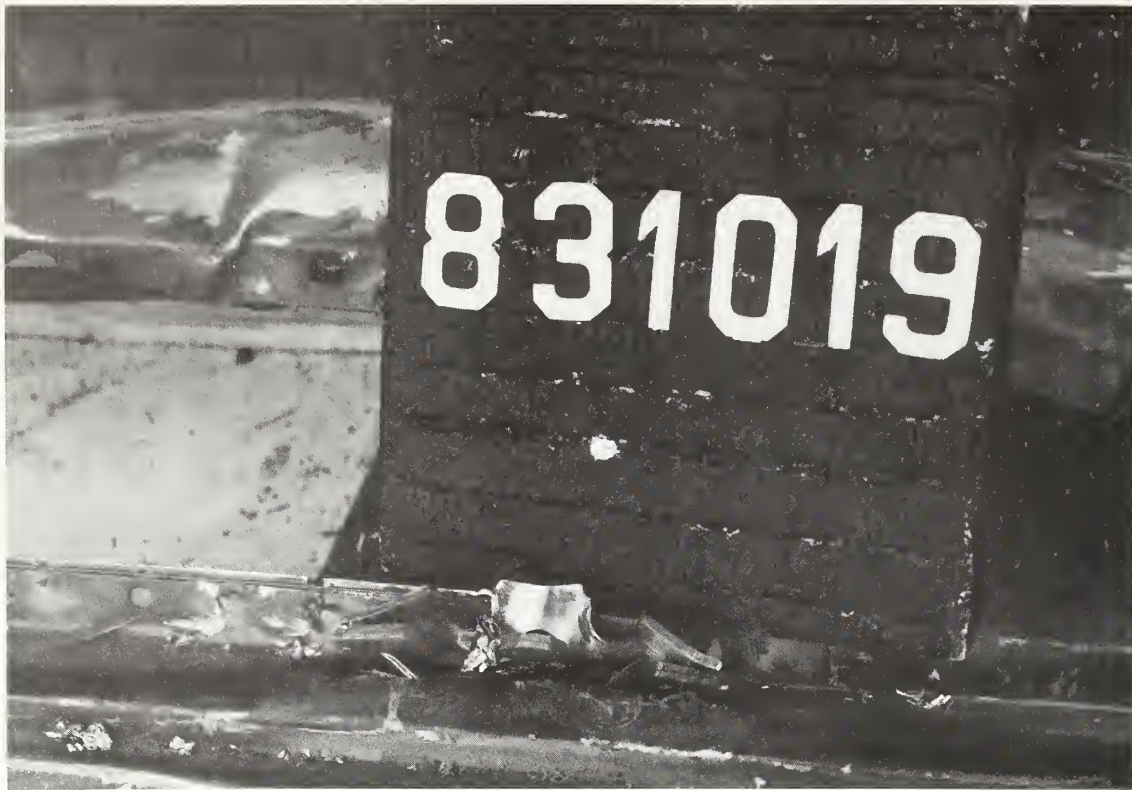


Figure A-25. POST-TEST VEHICLE DAMAGE - VIEW 3

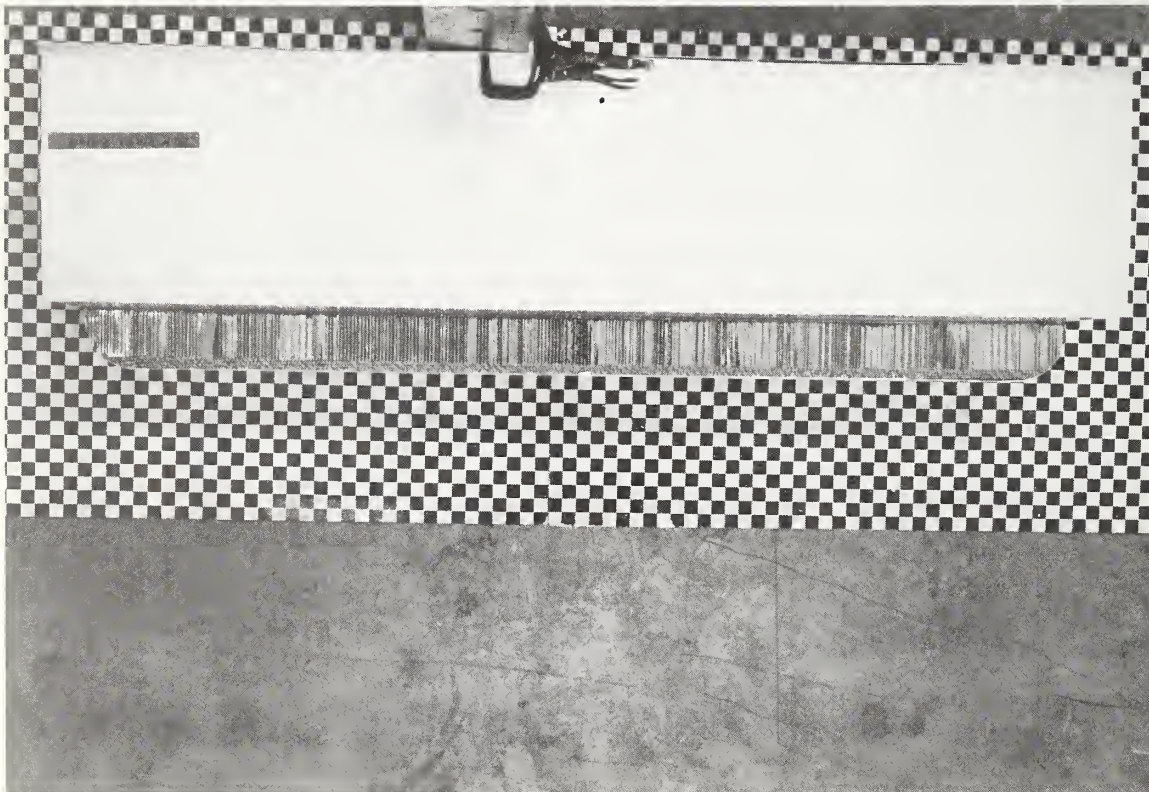


Figure A-26. PRE-TEST MDD FACE - VIEW 1

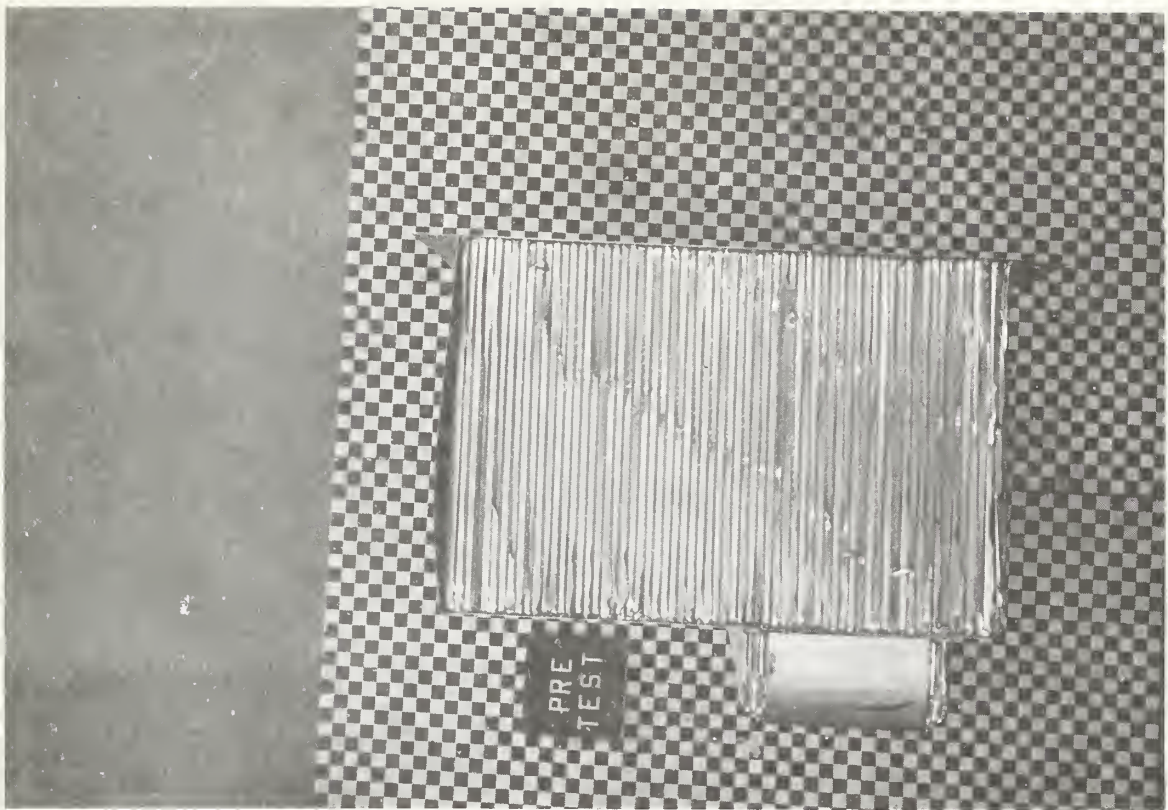


Figure A-27. PRE-TEST MDB FACE - VIEW 2

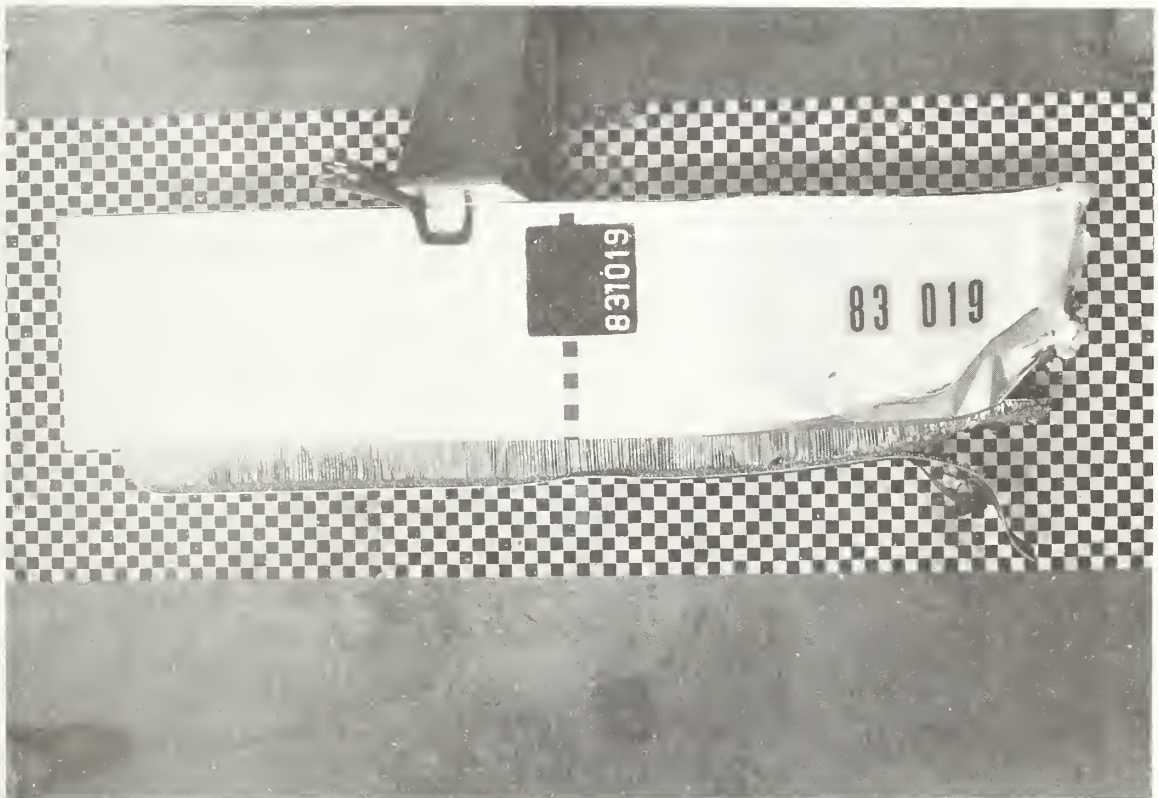


Figure A-28. POST-TEST MDB FACE - VIEW 1

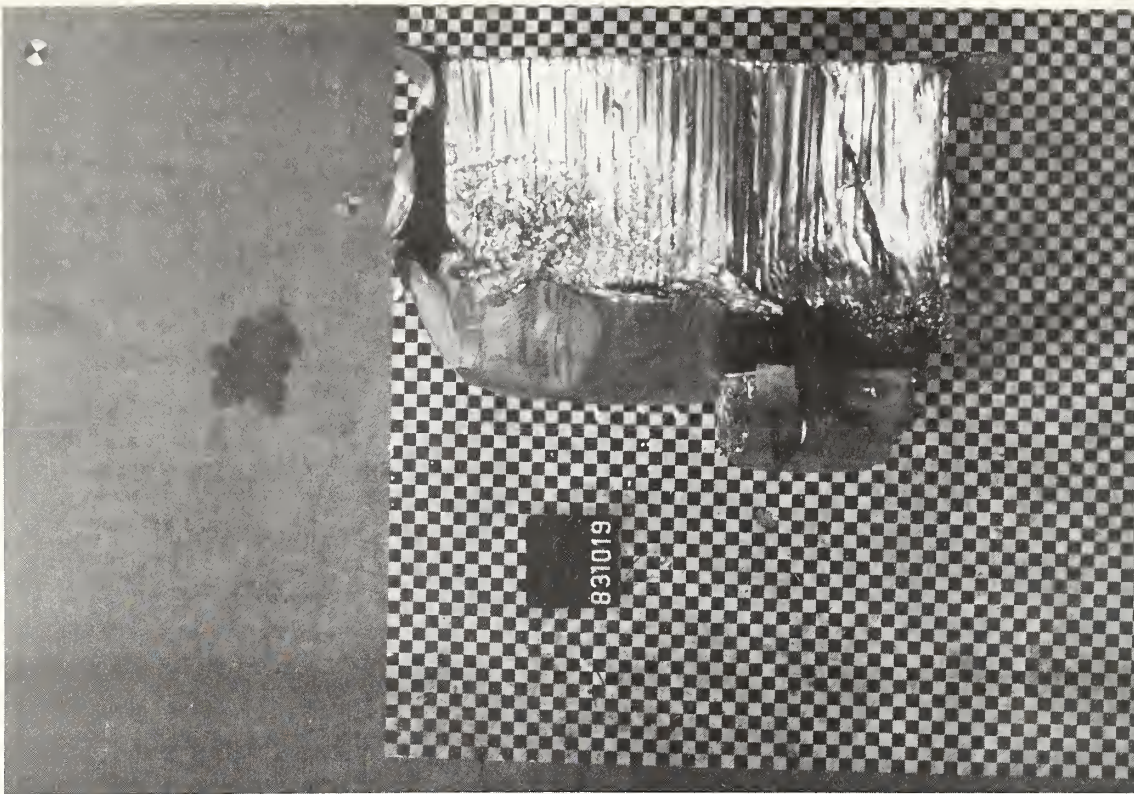


Figure A-29. POST-TEST MDB FACE - VIEW 2

APPENDIX B

DATA PLOT PRESENTATION

Data plots generated from the crash test data are presented on the following pages. All data are recorded on magnetic tape for inclusion in the NHTSA crash test data base system. All data were filtered according to SAE J211, except that dummy thorax data were filtered using the HSRI filter.

EVALUATION OF MOD YW FLEET

83292000000

HEDXG1

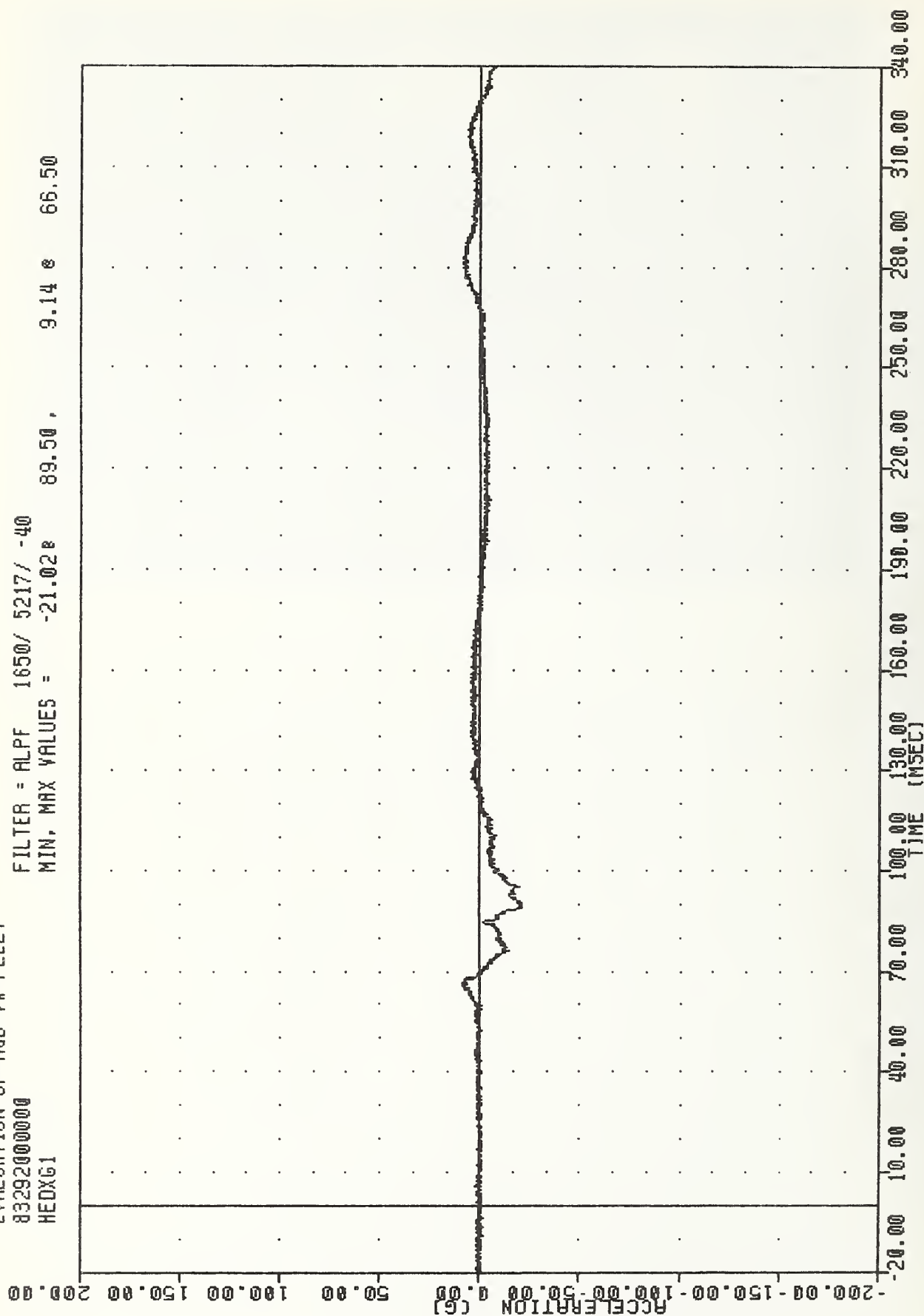
FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -21.02g

89.50,

9.14g

66.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION X AXIS

EVALUATION OF MOD VW FLEET

83292000000

HEDYG1

FILTER = ALPF 1650/ 5217/ -40

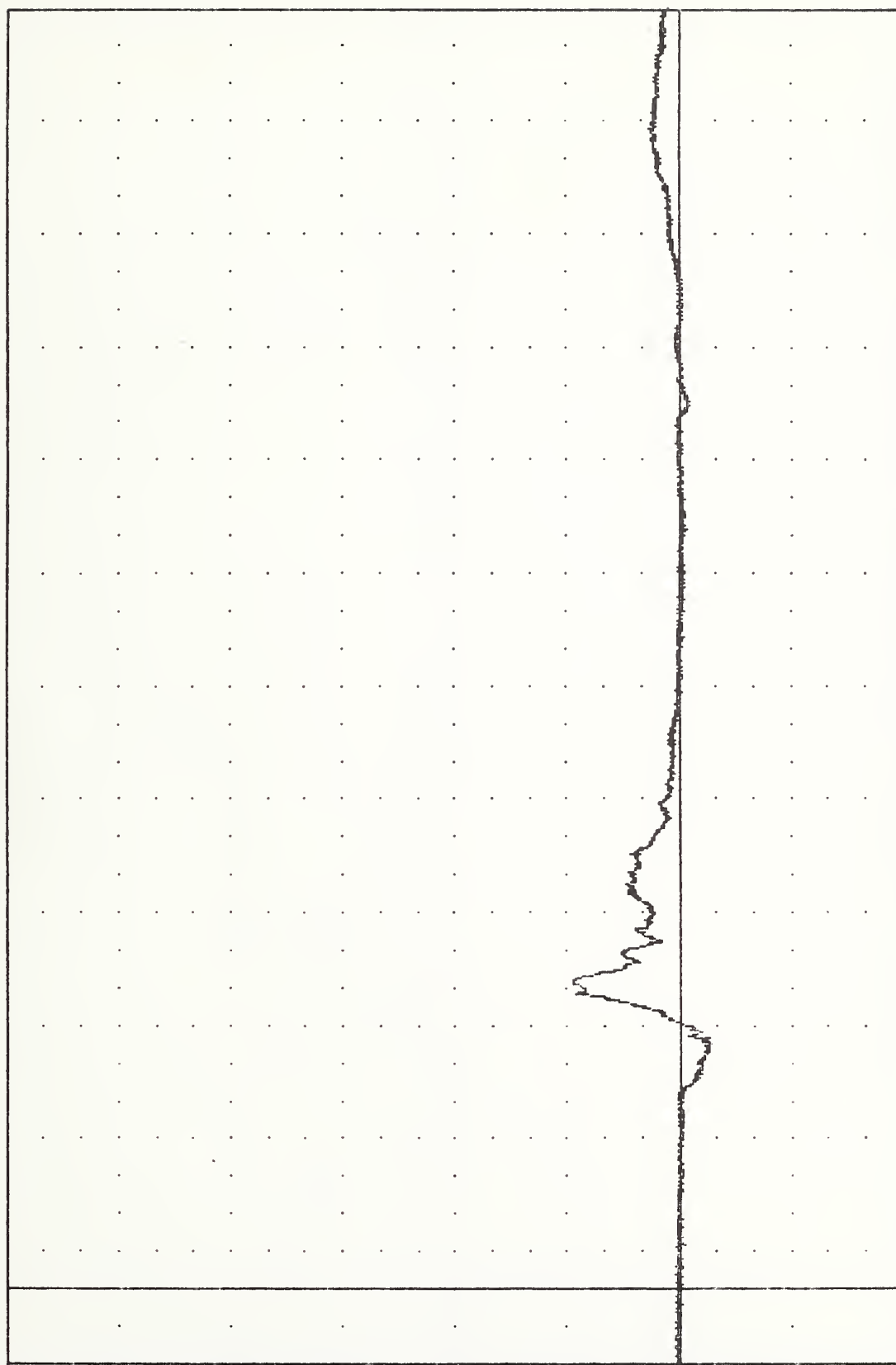
MIN, MAX VALUES = -14.31g

65.00,

47.57 g

81.25

ACCELERATION (G)



TIME (msec)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Y AXIS

EVALUATION OF M00 VW FLEET

832920000000

HEDZ61

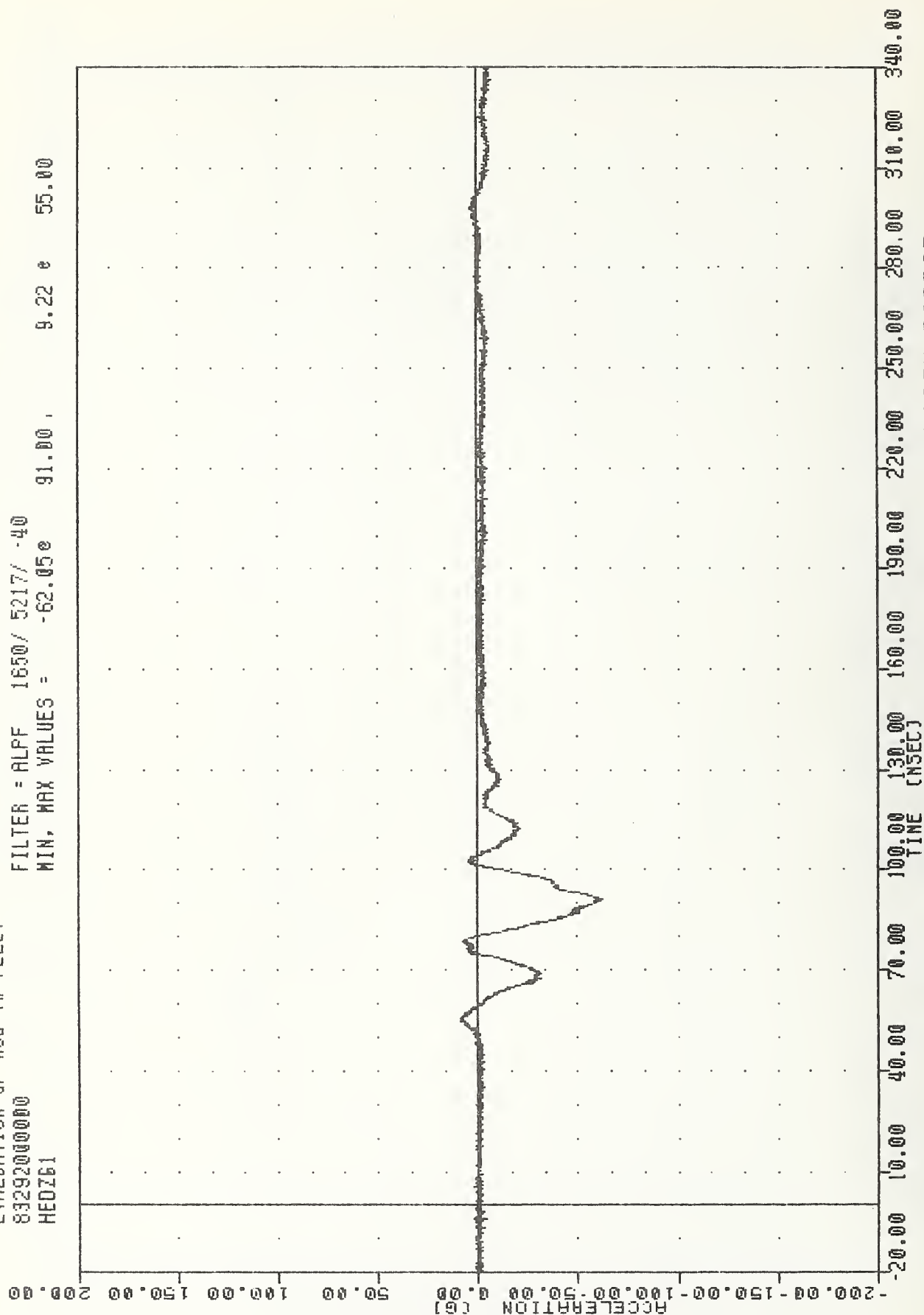
FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -62.05e

91.00 ,

9.22 e

55.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER HEAD ACCELERATION Z AXIS

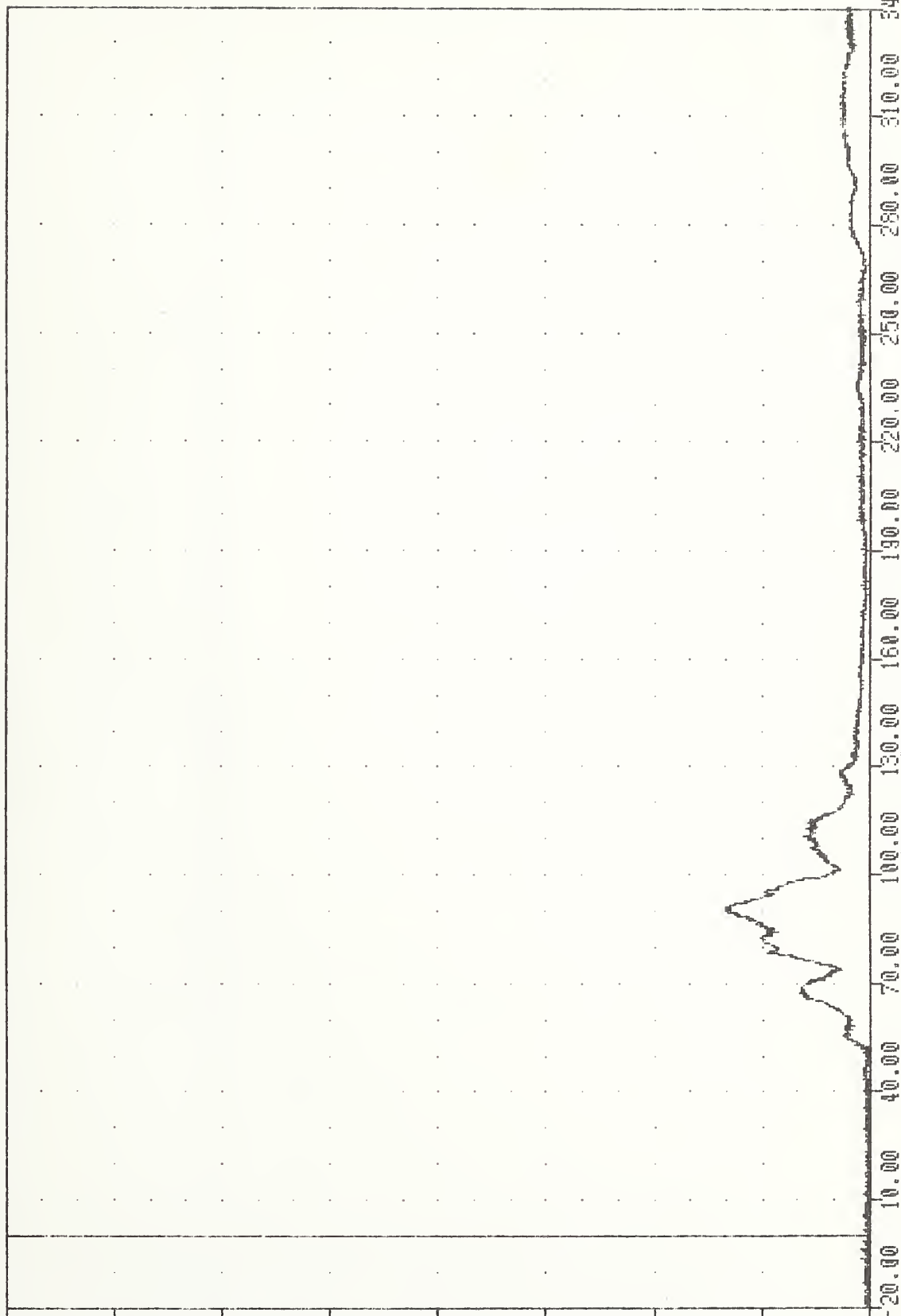
INC , 831019
 EVALUATION OF MOD VW FLEET
 83292000000
 HEADG1

FLUI DATE 24-DEC-83 08:14:51

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = 0.048 10.50 , 67.15 89.88

ACCELERATION (G)

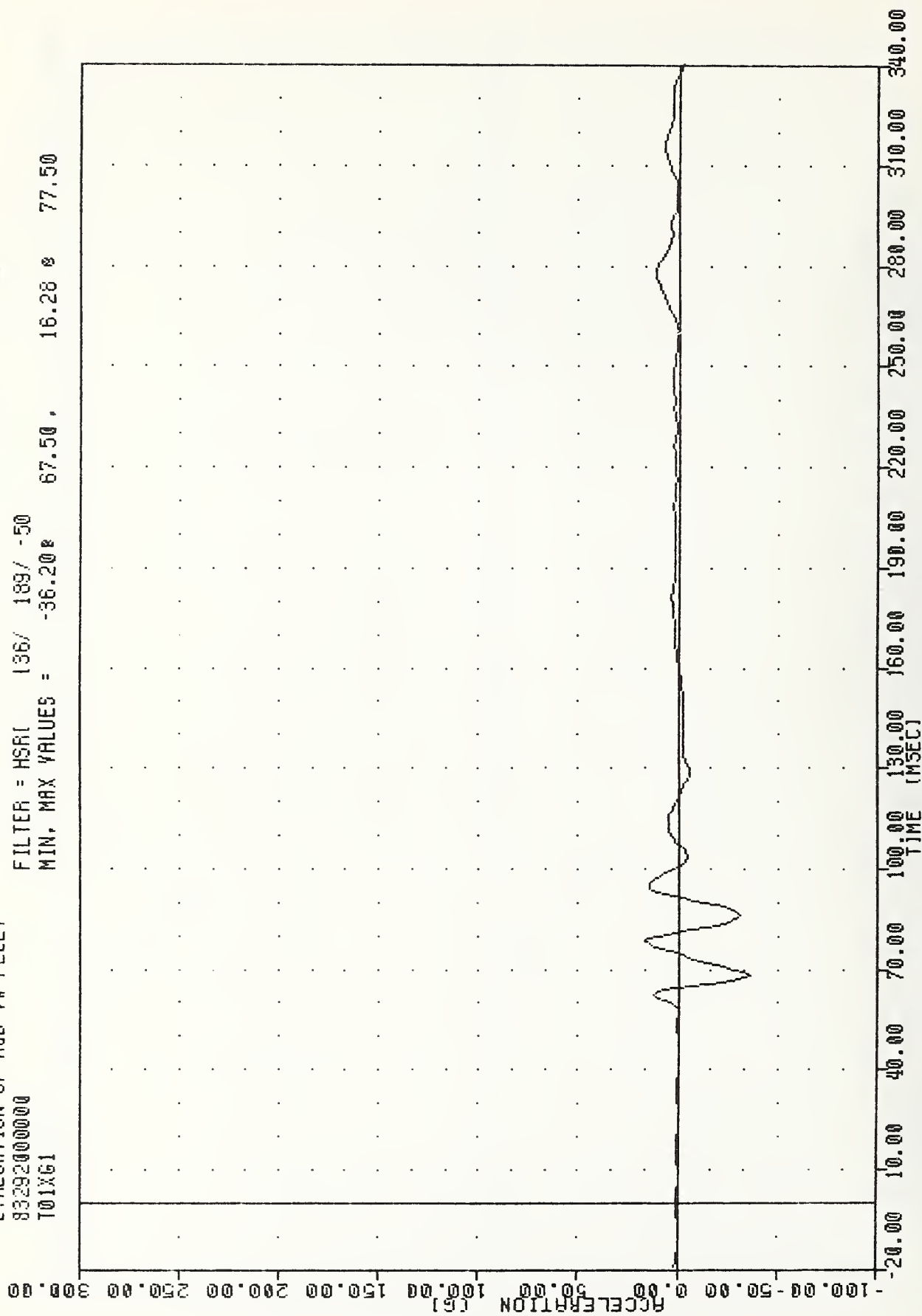


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER HEAD RESULTANT

EVALUATION OF MOD VW FLEET
 83292000000
 T01XG1

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -36.20 67.50

16.28 77.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE ACCELERATION X AXIS

EVALUATION OF MDD VW FLEET

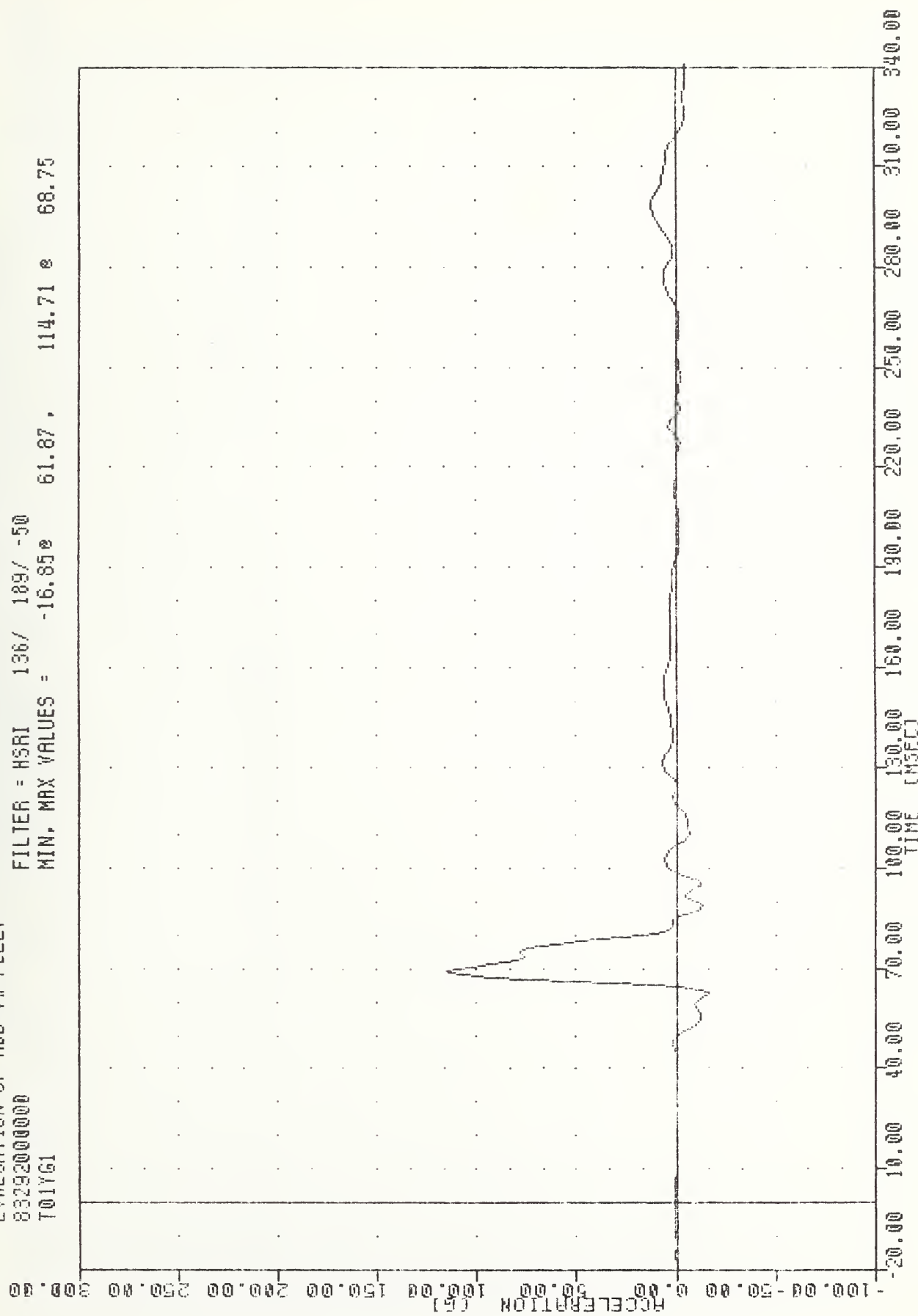
832920000000

T01Y61

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -16.85%

61.87, 114.71, 68.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION Y AXIS

EVALUATION OF MOD VN FLEET

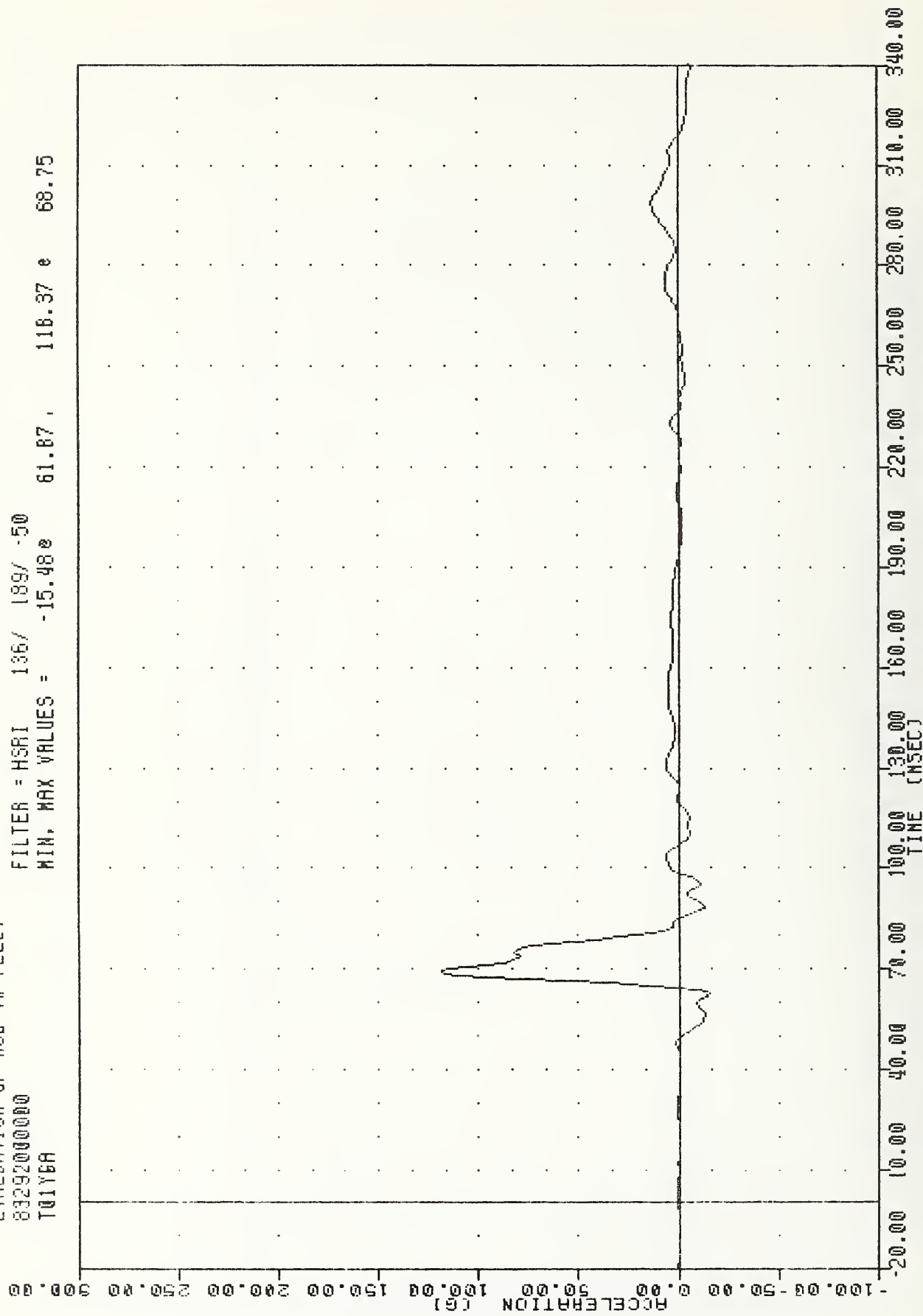
83292000000

T01Y6A

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -15.48e

61.87, 116.37 e 68.75



EVALUATION OF MOD VW FLEET

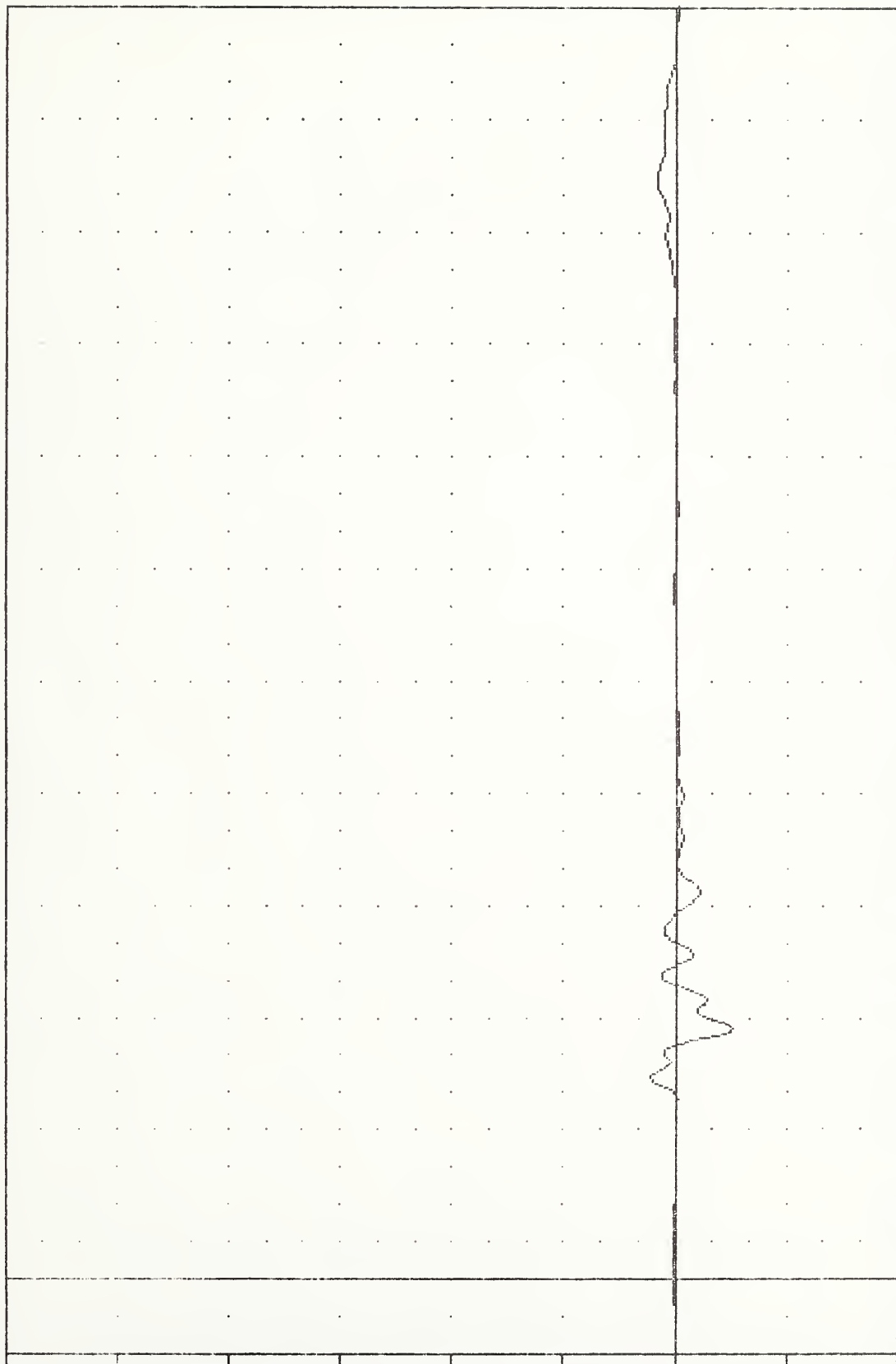
83292000000

701761

FILTER = HSR 136/ 189/ -50

MIN. MAX VALUES = -25.71 66.25, 11.07 53.12

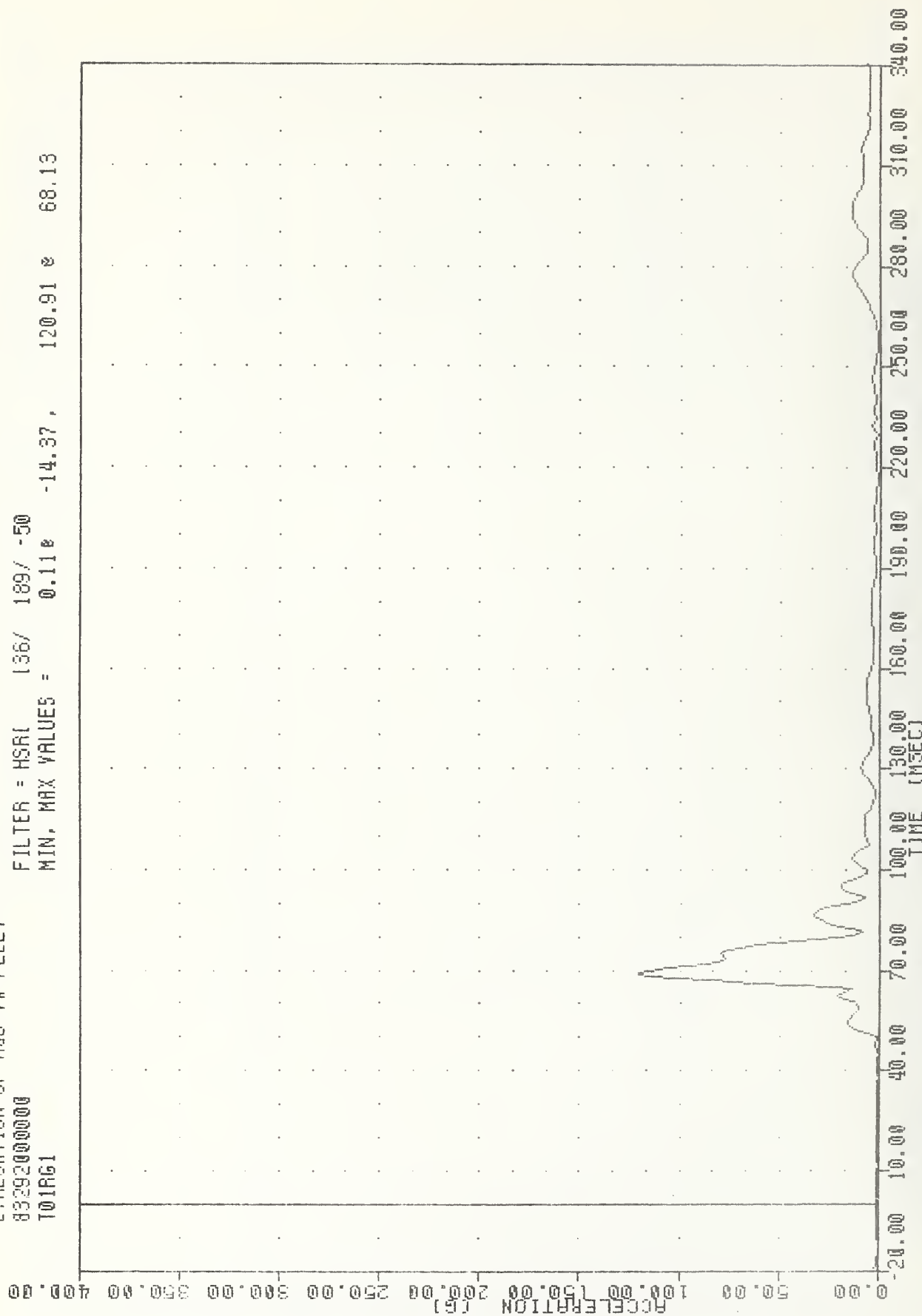
ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER UPPER SPINE ACCELERATION Z AXIS

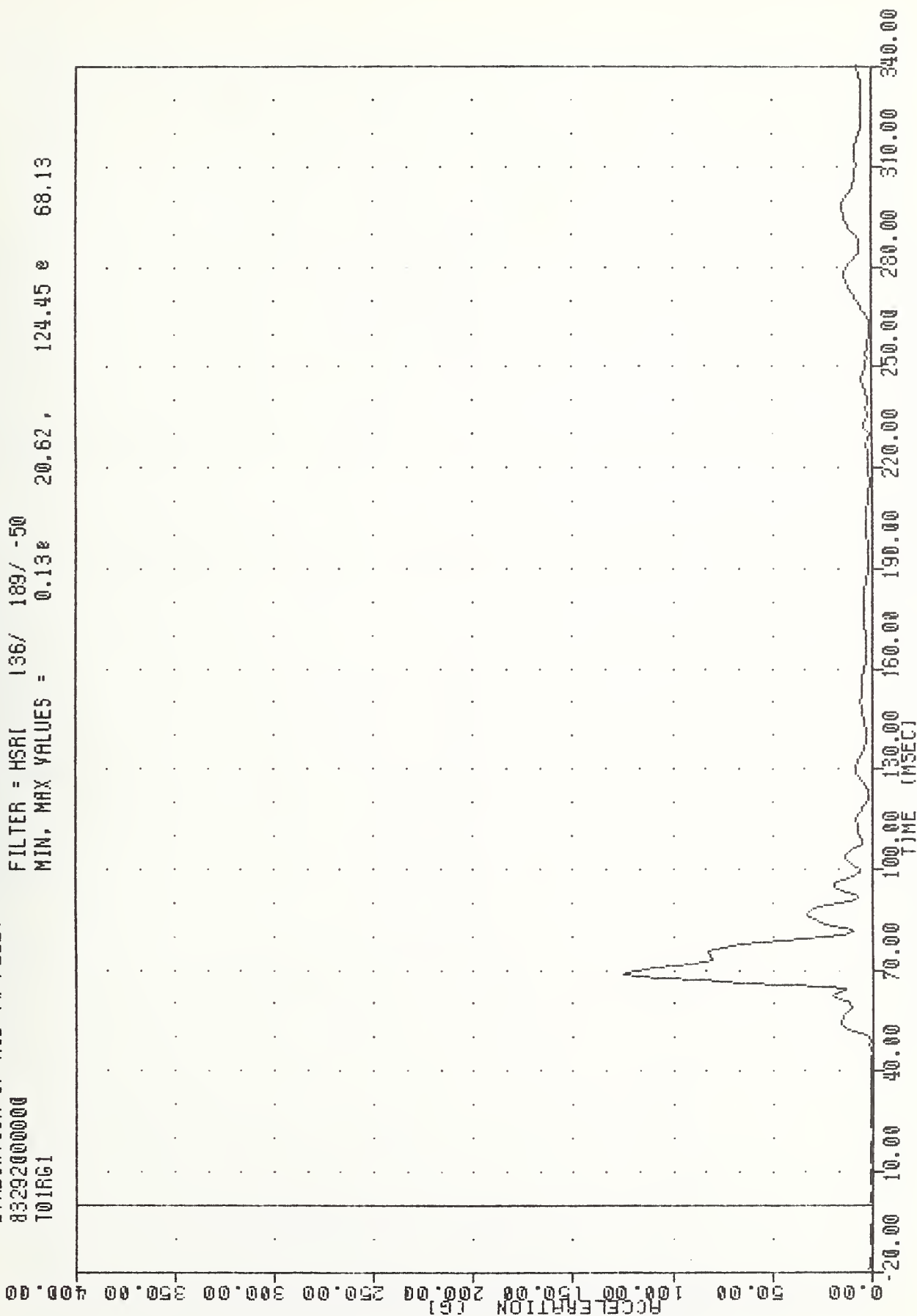
EVALUATION OF M00 YW FLEET
 832920000000
 T01R61

FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = 0.11e -14.37, 120.91 e 68.13



EVALUATION OF MOD YW FLEET
 83292000000
 T01RG1

FILTER = HSR1 136/ 189/ -50
 MIN. MAX VALUES = 0.13e 124.45 e 68.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER UPPER SPINE RESULTANT USING T01YGA

EVALUATION OF NAD VW FLEET

832920000000

T01YV1

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -3.218

63.75 , 28.40 @ 318.12



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING T01YV1

EVALUATION OF MOD VW FLEET

832920000000

T01YVA

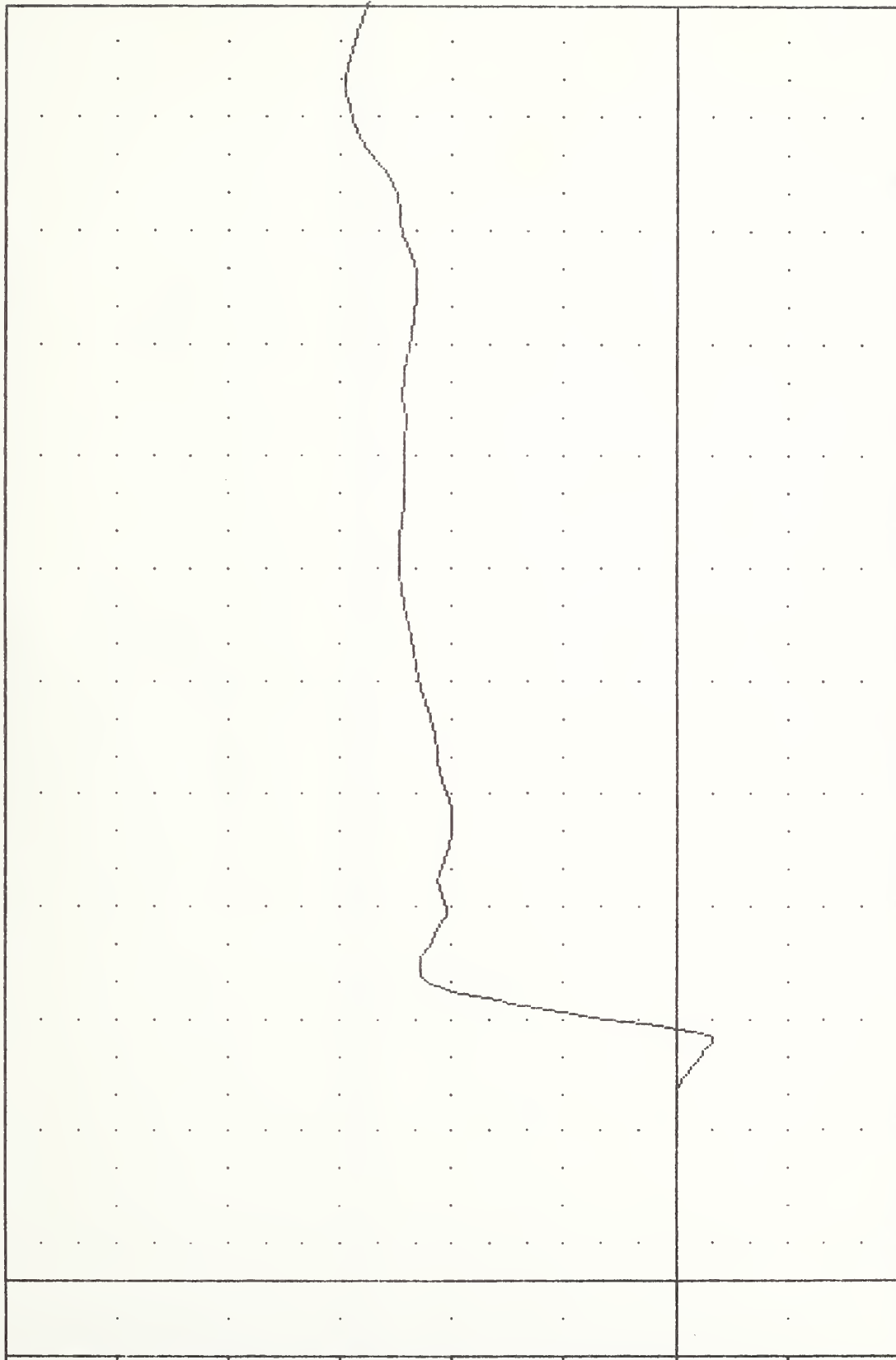
FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -3.290

63.75 , 29.63 0 318.12

VELOCITY (MPH)

B-13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING T01YGA

EVALUATION OF MOD VW FLEET

83292000000

T12XG1

FILTER = HSRI 136/ 189/ -50

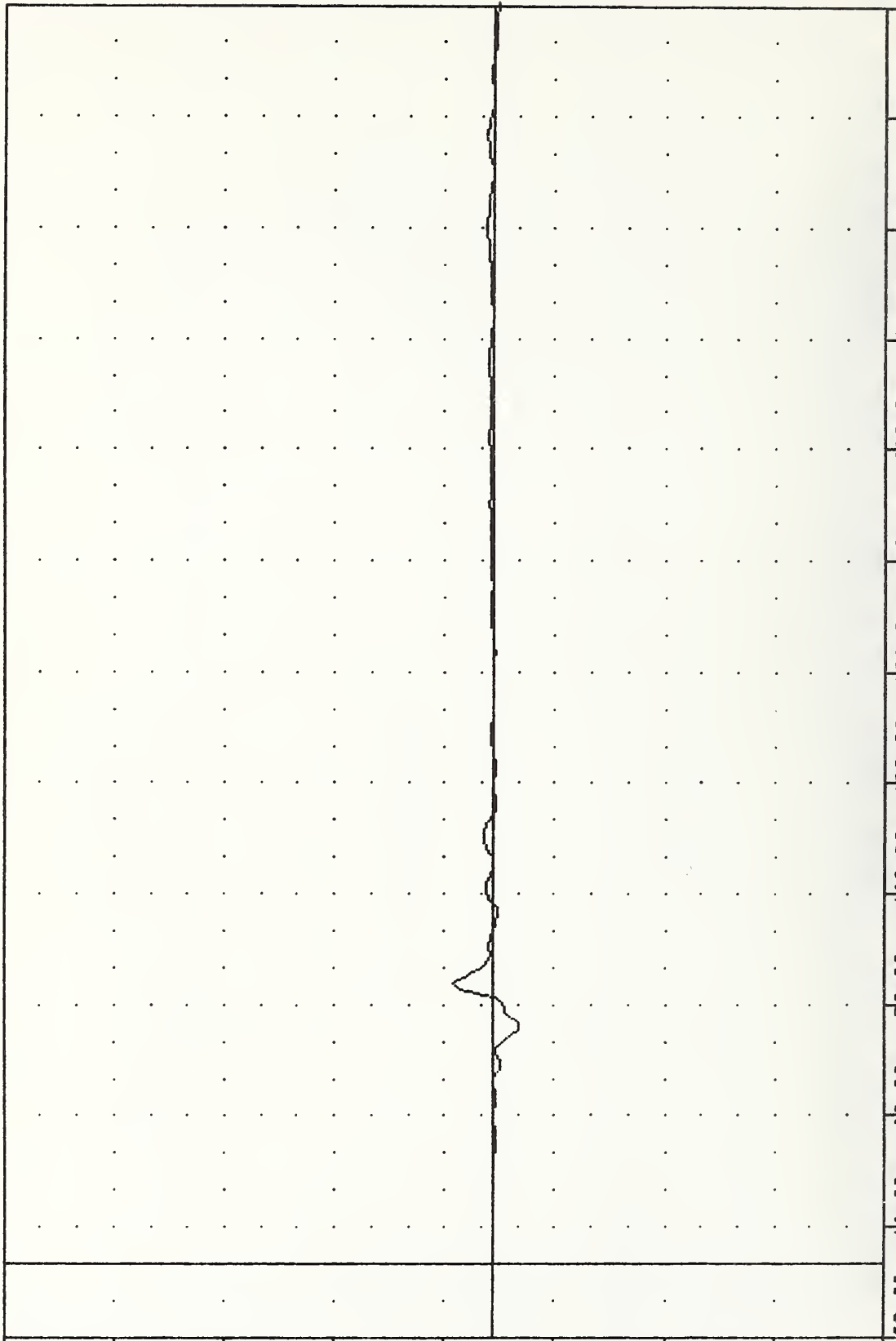
MIN. MAX VALUES = -21.31e

63.75 .

32.14 e

75.00

ACCELERATION (G)



TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION X AXIS

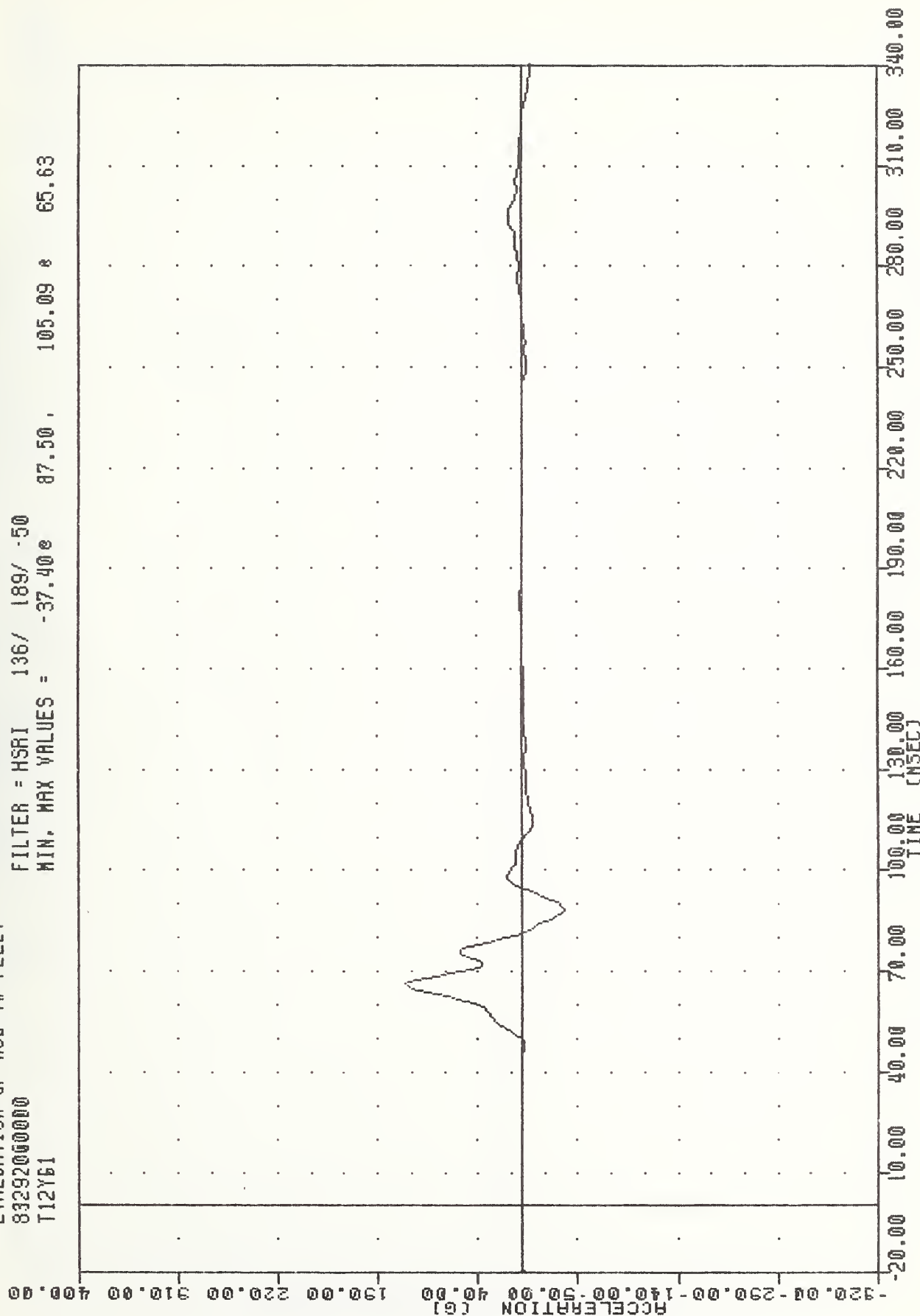
EVALUATION OF MOD VW FLEET

83292000000

T12Y61

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -37.40e 87.50 , 105.09 e 65.63



EVALUATION OF MOD YW FLEET

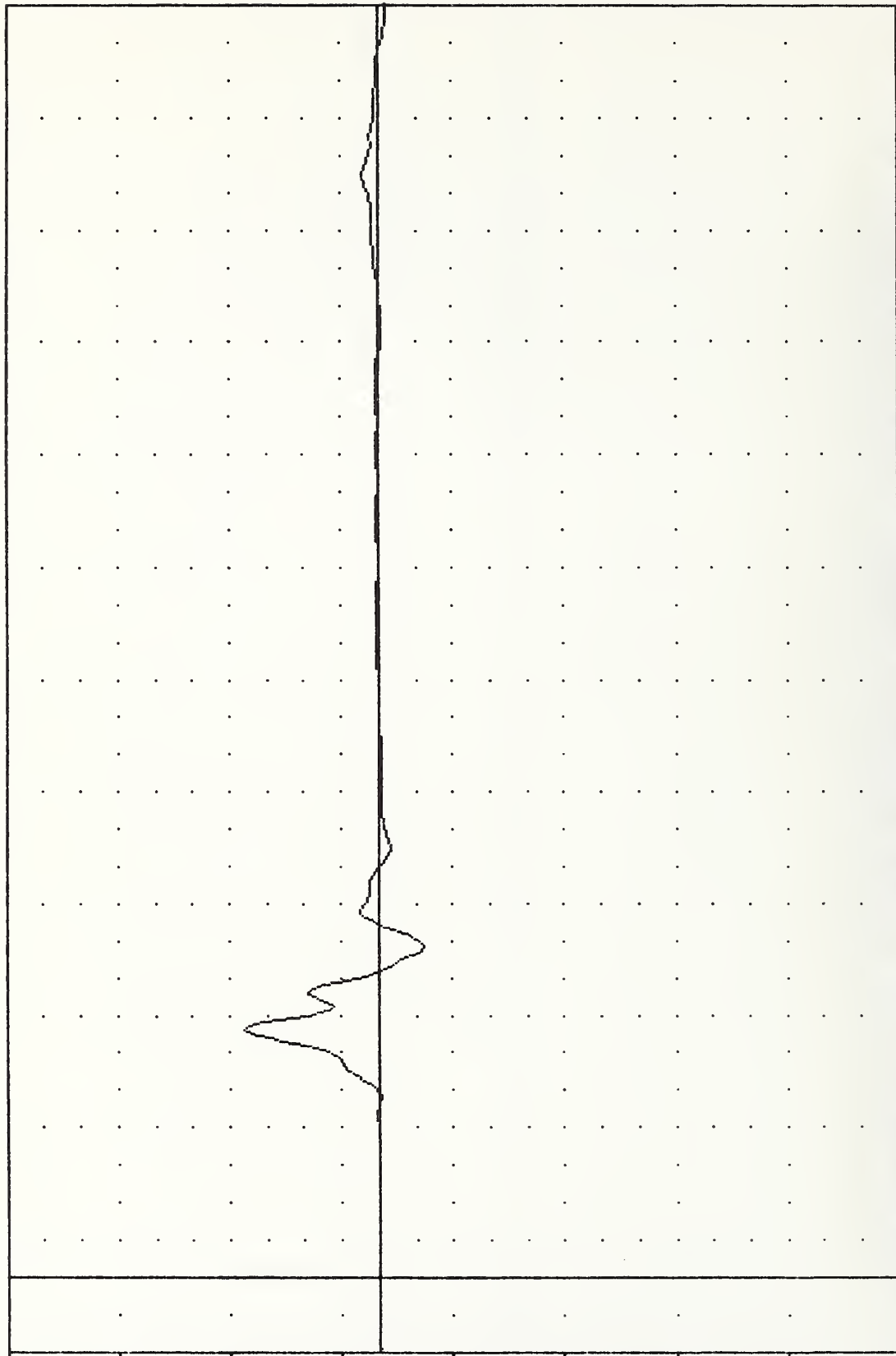
83292000000

T12YGA

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -36.77 e 88.13, 107.86 e 65.63

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION #2 Y AXIS

EVALUATION OF MDD VW FLEET

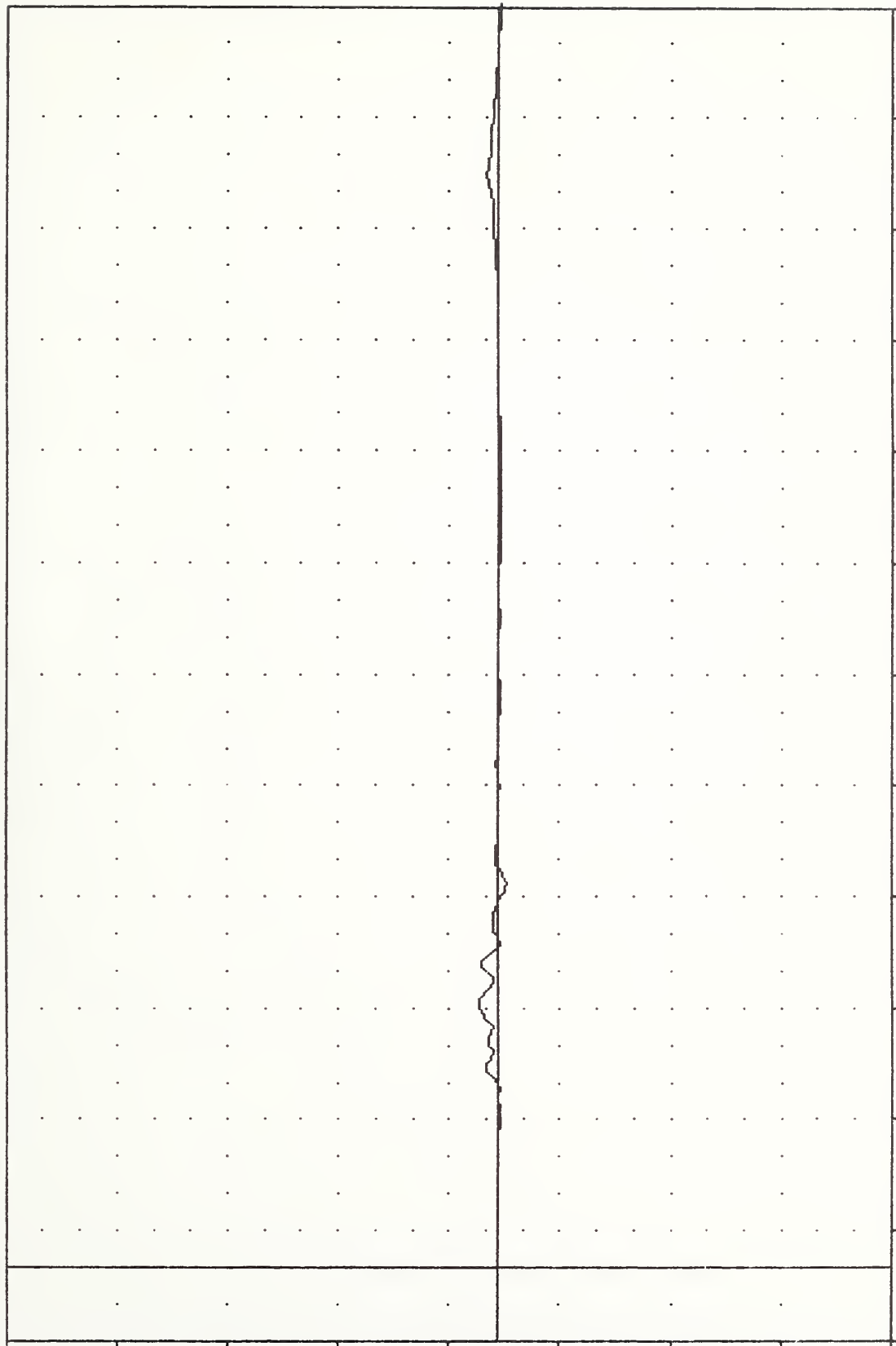
83292000000

T12ZG1

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -6.59e 103.13, 15.34 e 70.63

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE ACCELERATION Z AXIS

EVALUATION OF MDD VW FLEET

83292000000

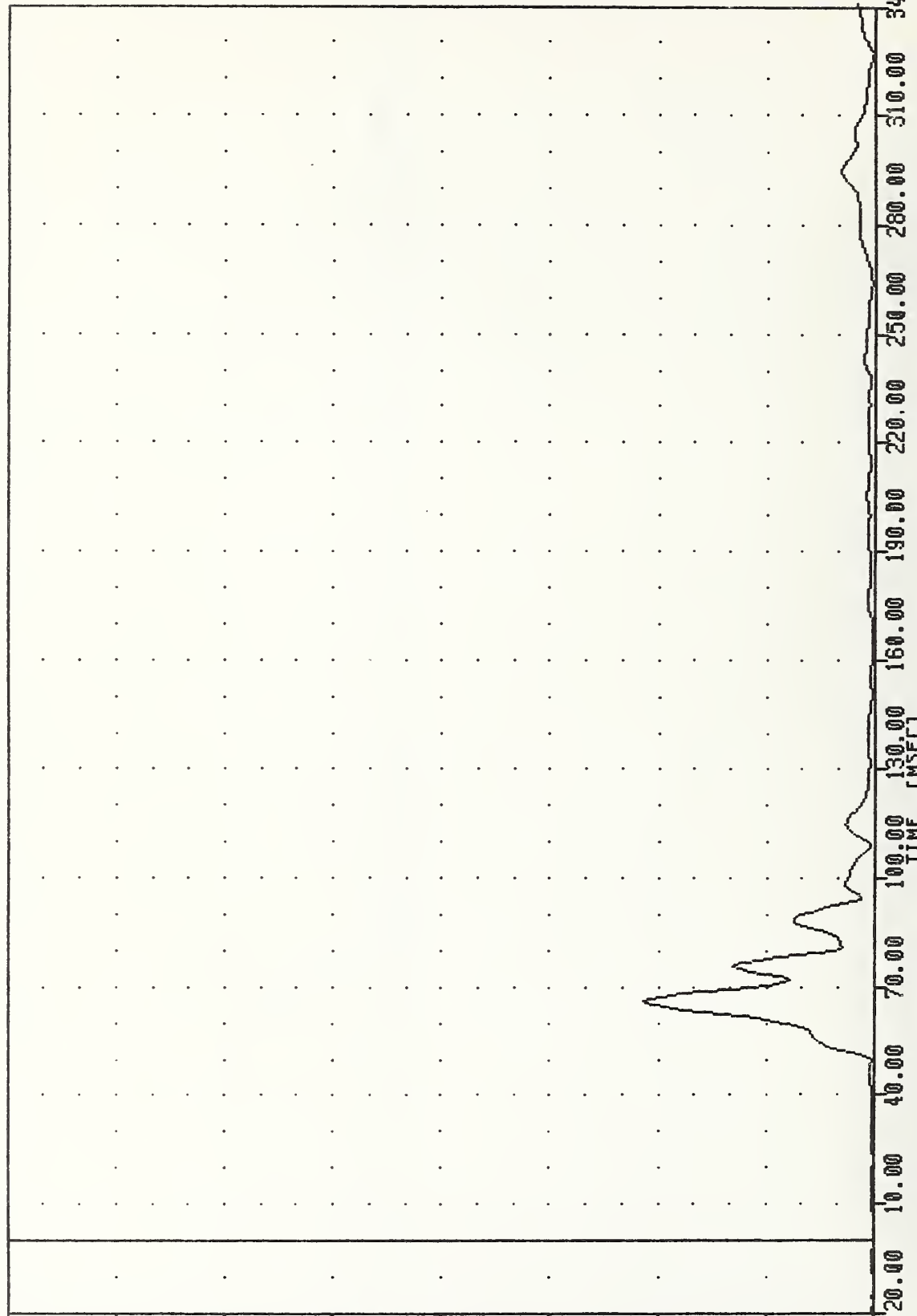
T12R61

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = 0.070

1.25, 106.47 @ 65.63

ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT

EVALUATION OF MDD VV FLEET

83292000000

T12RG1

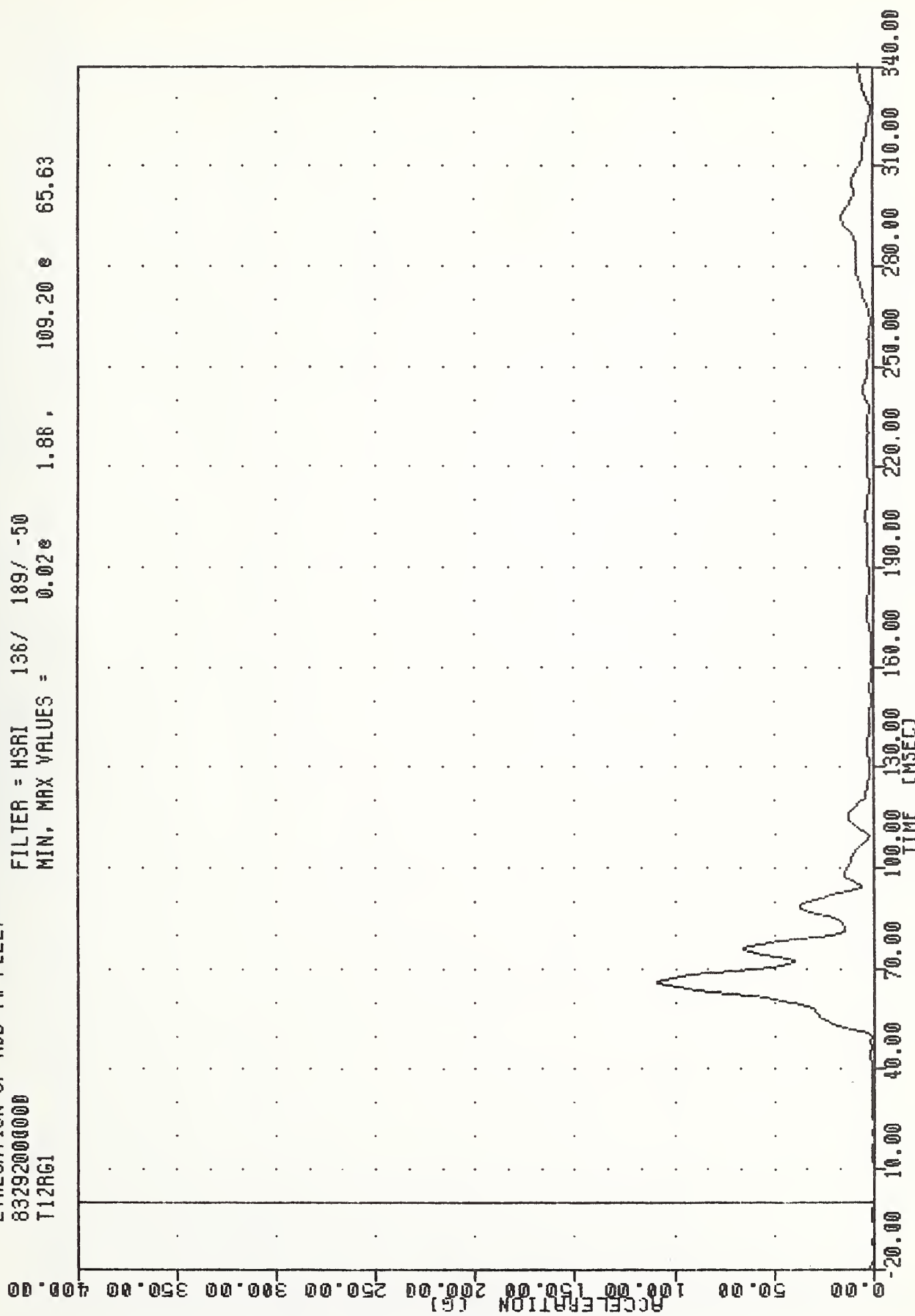
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = 0.02e

1.88,

109.20 e

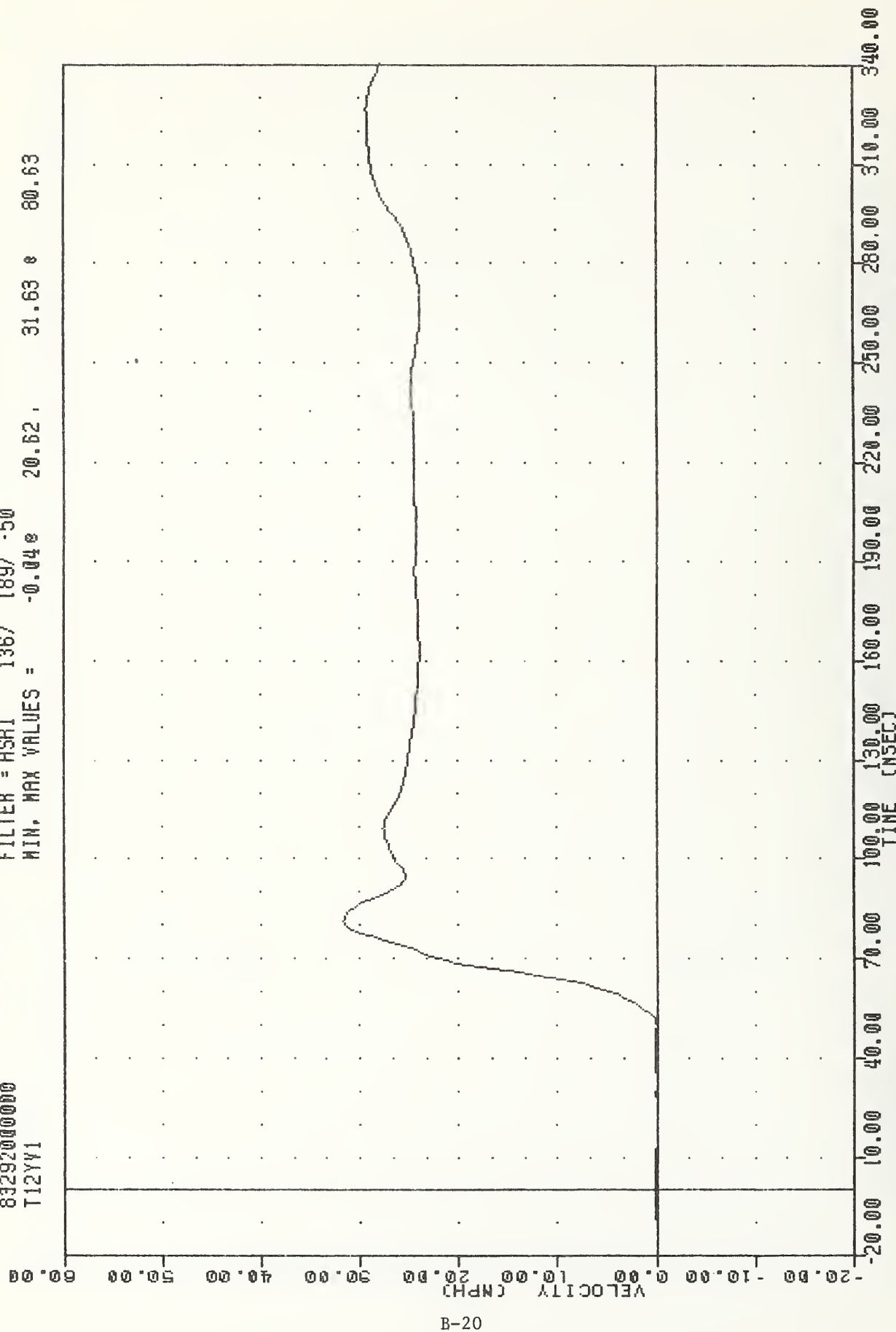
65.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LOWER SPINE RESULTANT USING T12YGA

EVALUATION OF MOD VV FLEET
 832920000000
 T12YV1

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -0.048 20.62, 31.63 8 80.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGI

EVALUATION OF MOD VV FLEET

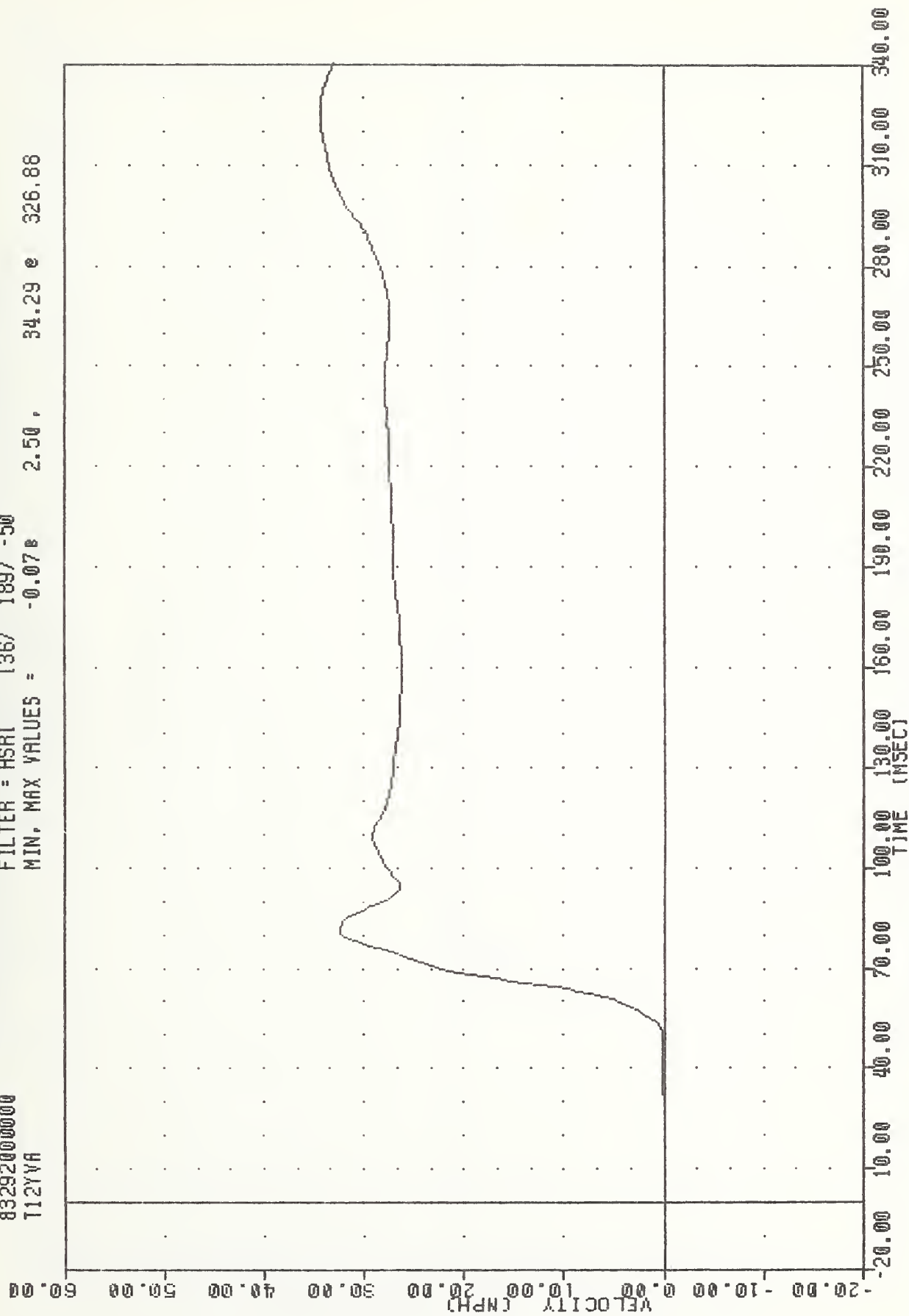
83292000000

T12YVA

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.07 2.50

34.29 e 326.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING T12YGA

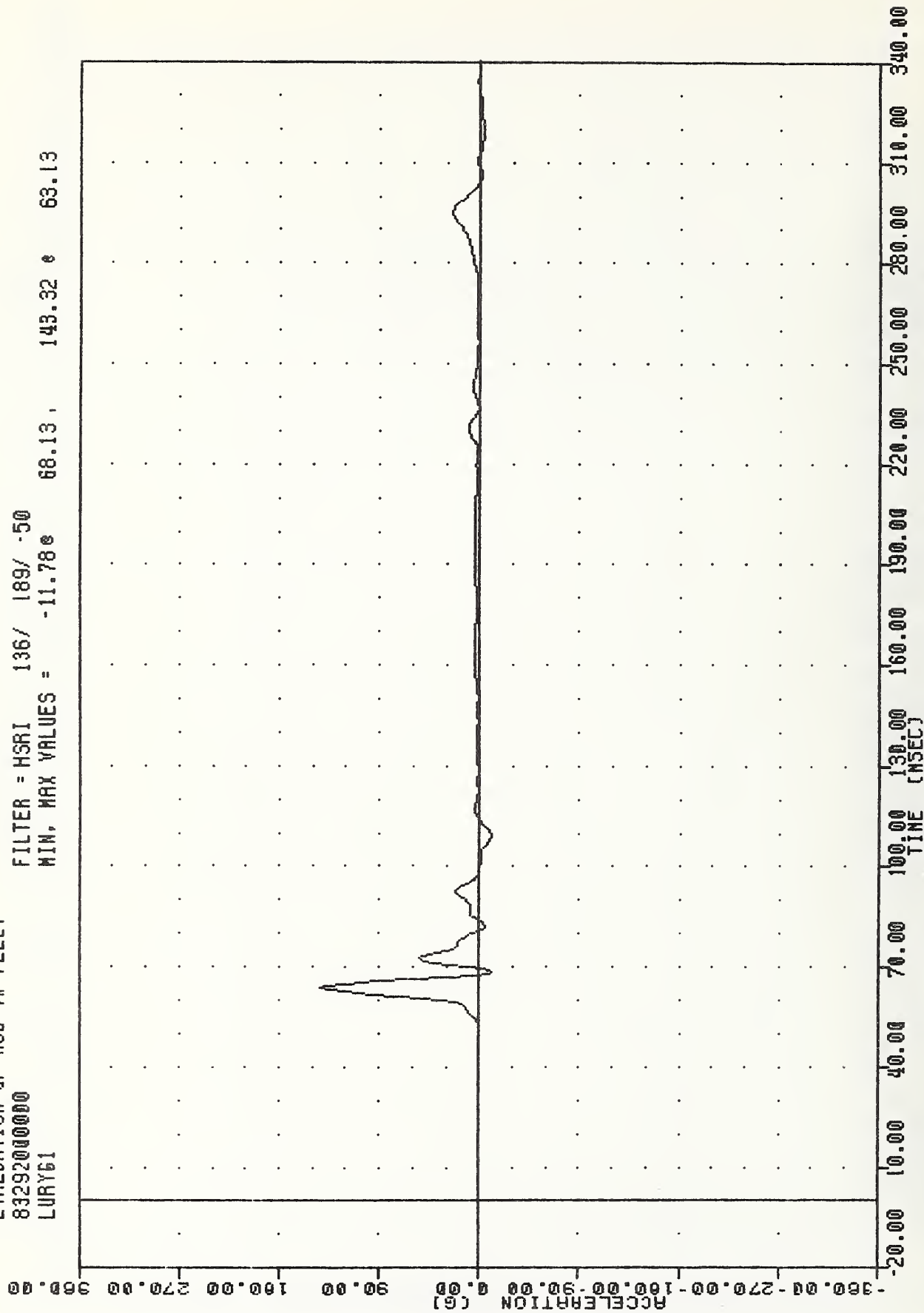
EVALUATION OF MOD VW FLEET

83292000000

LURY61

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -11.78e 68.13, 143.32 e 63.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT UPPER RIB ACCELERATION Y AXIS

EVALUATION OF MOD VW FLEET

83292000000

LURYV1

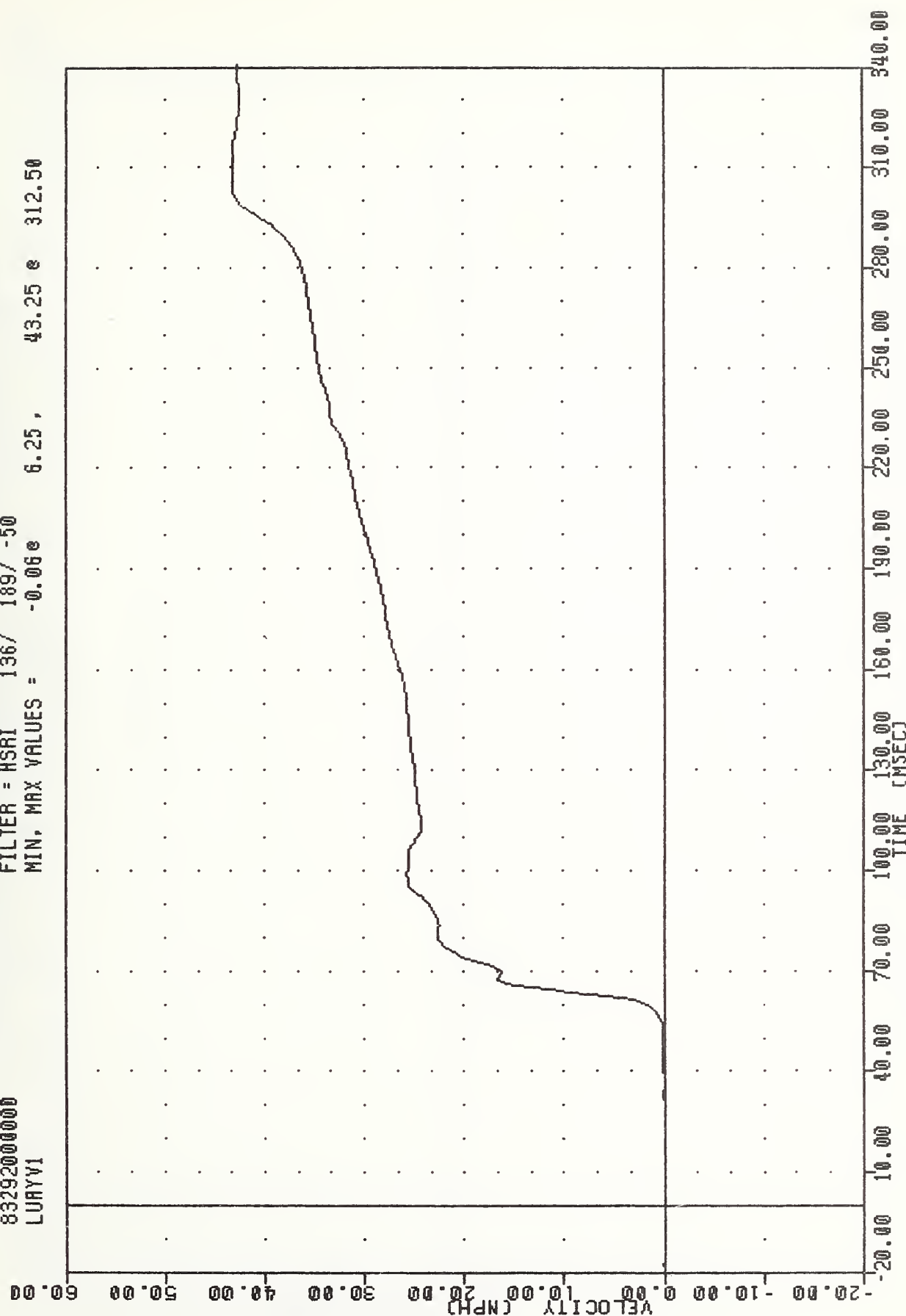
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.06e

6.25,

43.25 e

312.50

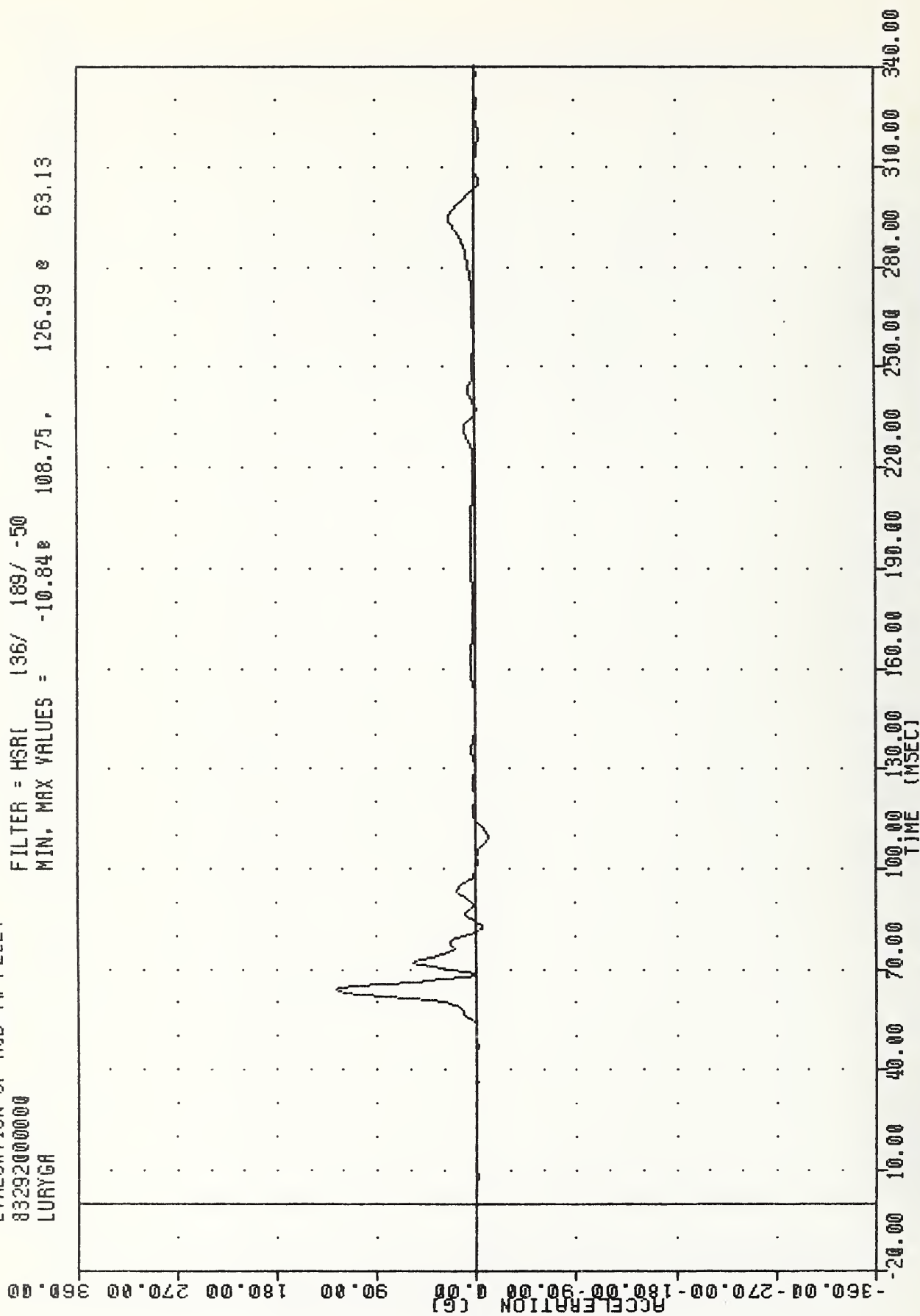


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING LURYG1

EVALUATION OF MOD YW FLEET
 83292000000
 LURYGA

FILTER = HSR(136/ 189/ -50
 MIN, MAX VALUES = -10.84e 108.75, 126.99 e 63.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT UPPER RIB ACCELERATION #2 Y AXIS

EVALUATION OF MOD VW FLEET

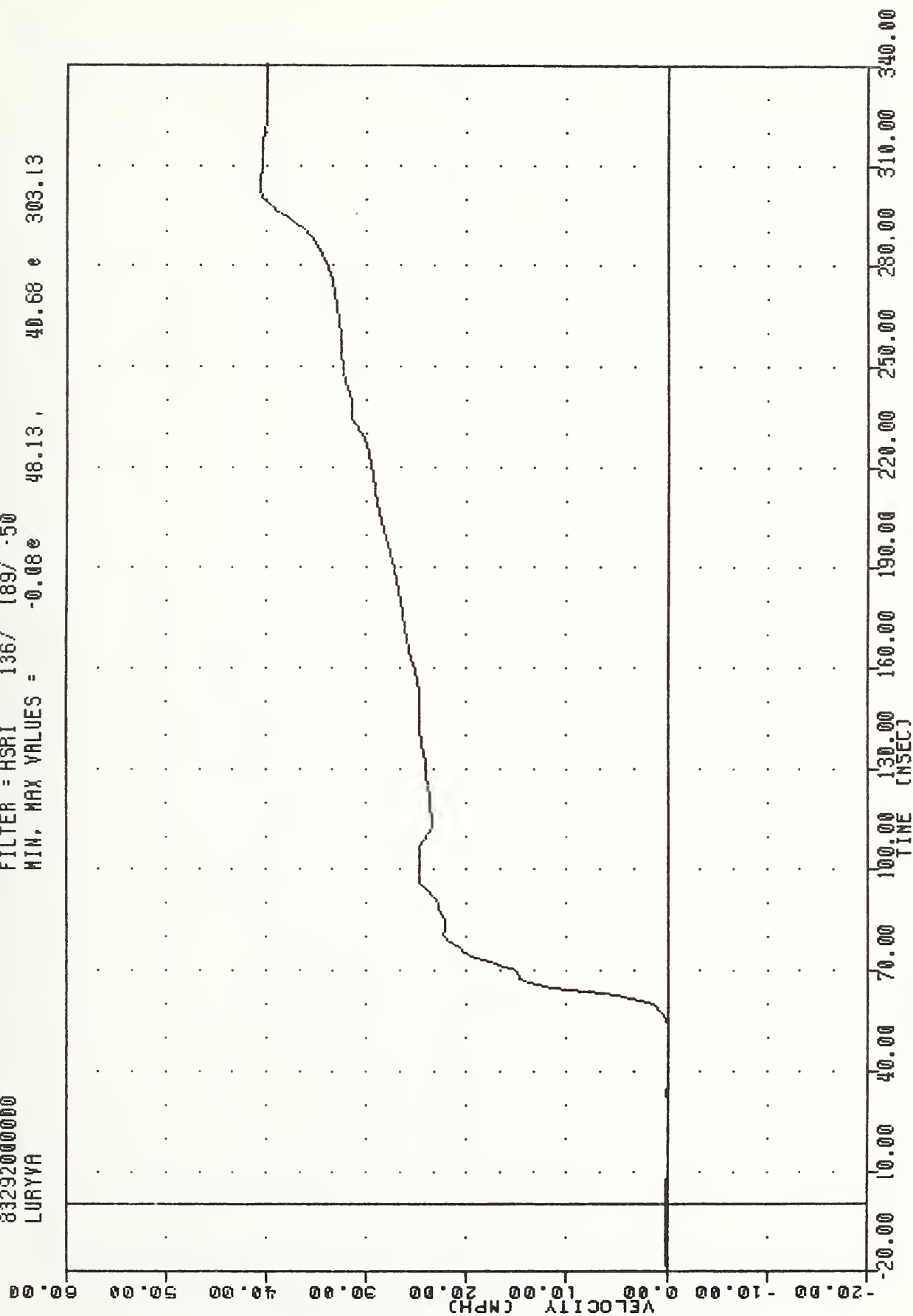
83292000000

LURYVA

FILTER = HSRI 136/ 189/ -50

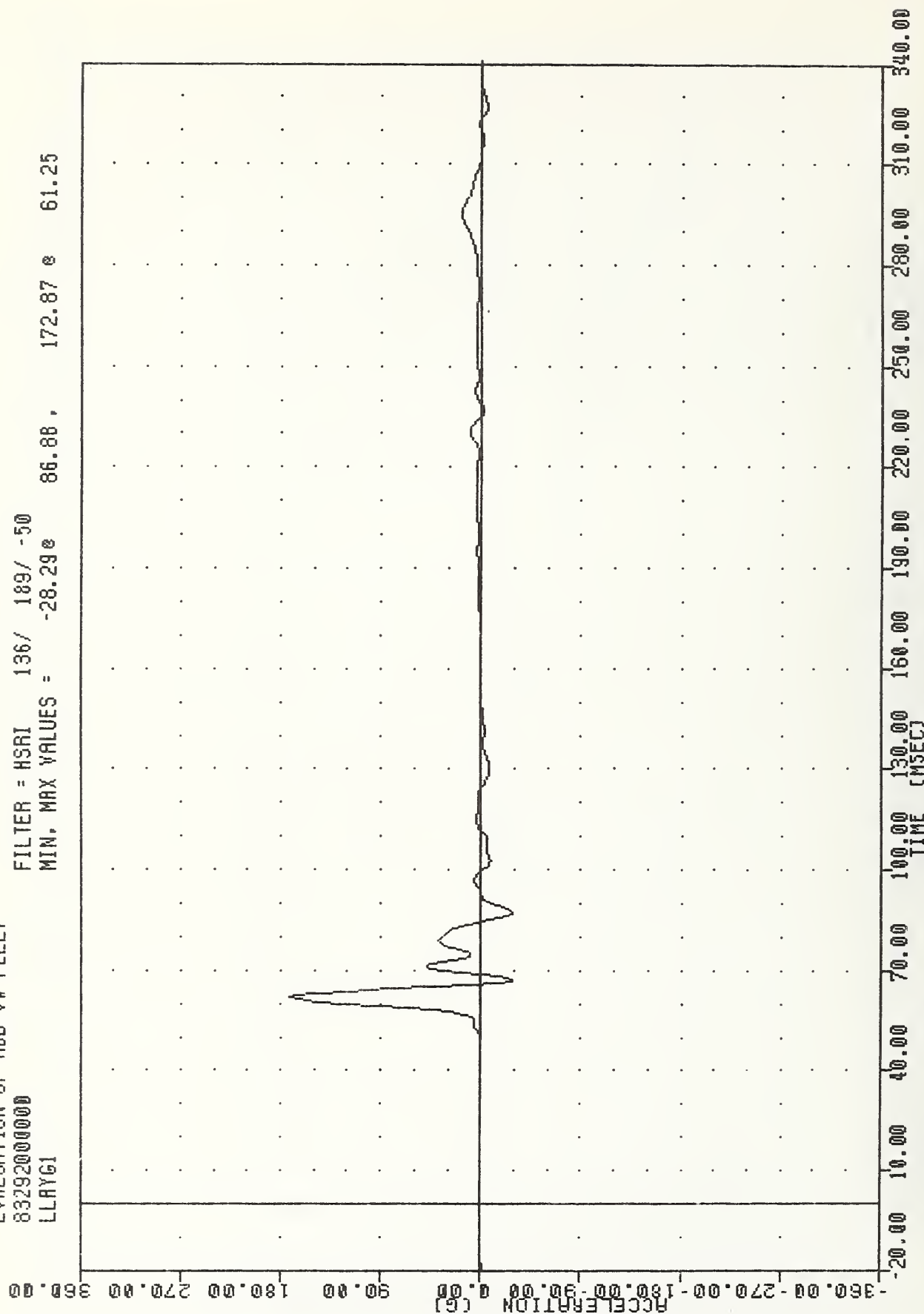
MIN, MAX VALUES = -0.08e

48.13, 40.68 e 303.13



EVALUATION OF MOD VW FLEET
 83292000000
 LLAYG1

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -28.29e 86.88, 172.87 e 61.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER LEFT LOWER RIB ACCELERATION Y AXIS

EVALUATION OF MOD YW FLEET

83292000000

LLRYV1

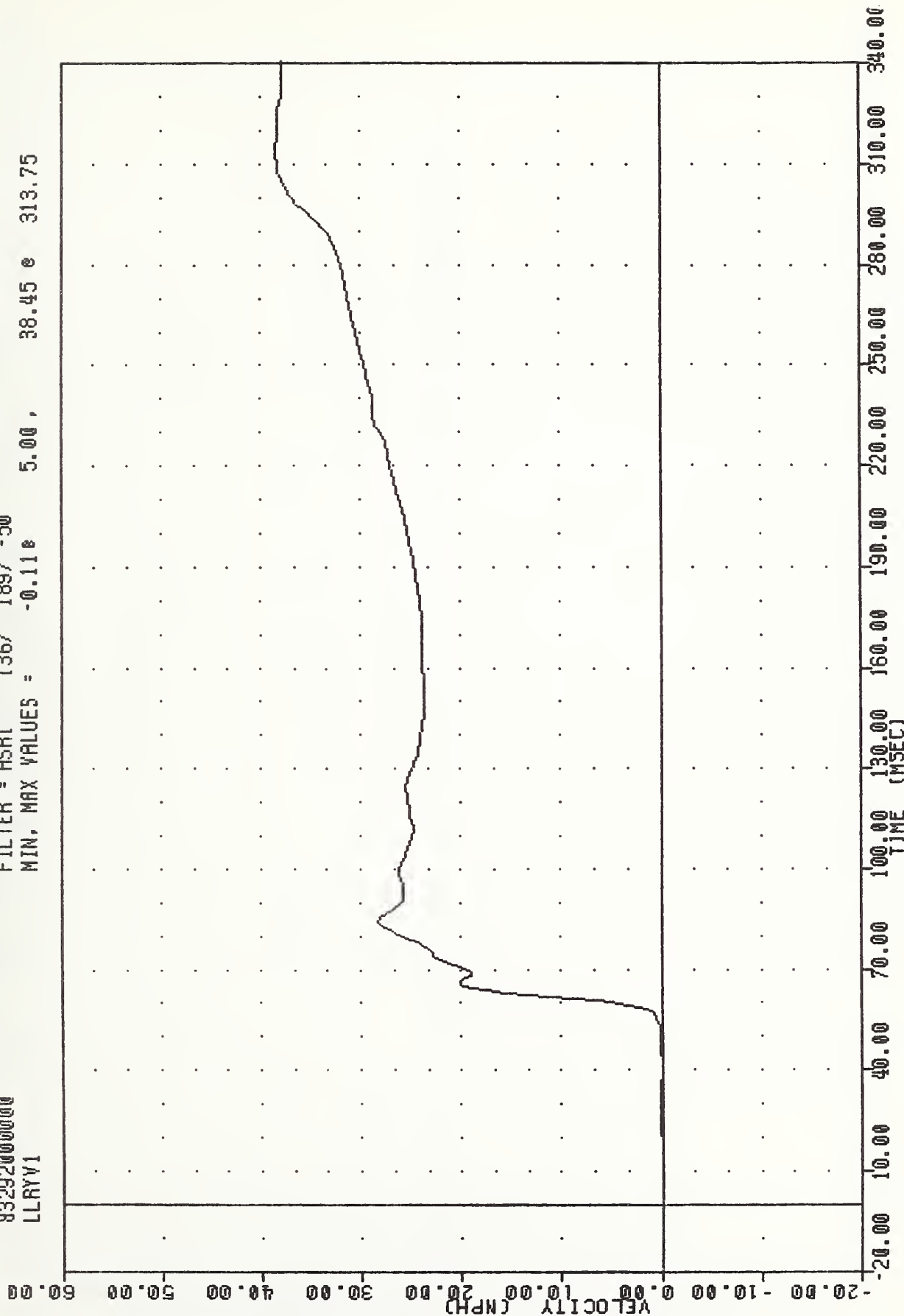
FILTER = HSAI 136/ 189/ -50

MIN, MAX VALUES = -0.11e

5.00,

38.45 e

313.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYG1

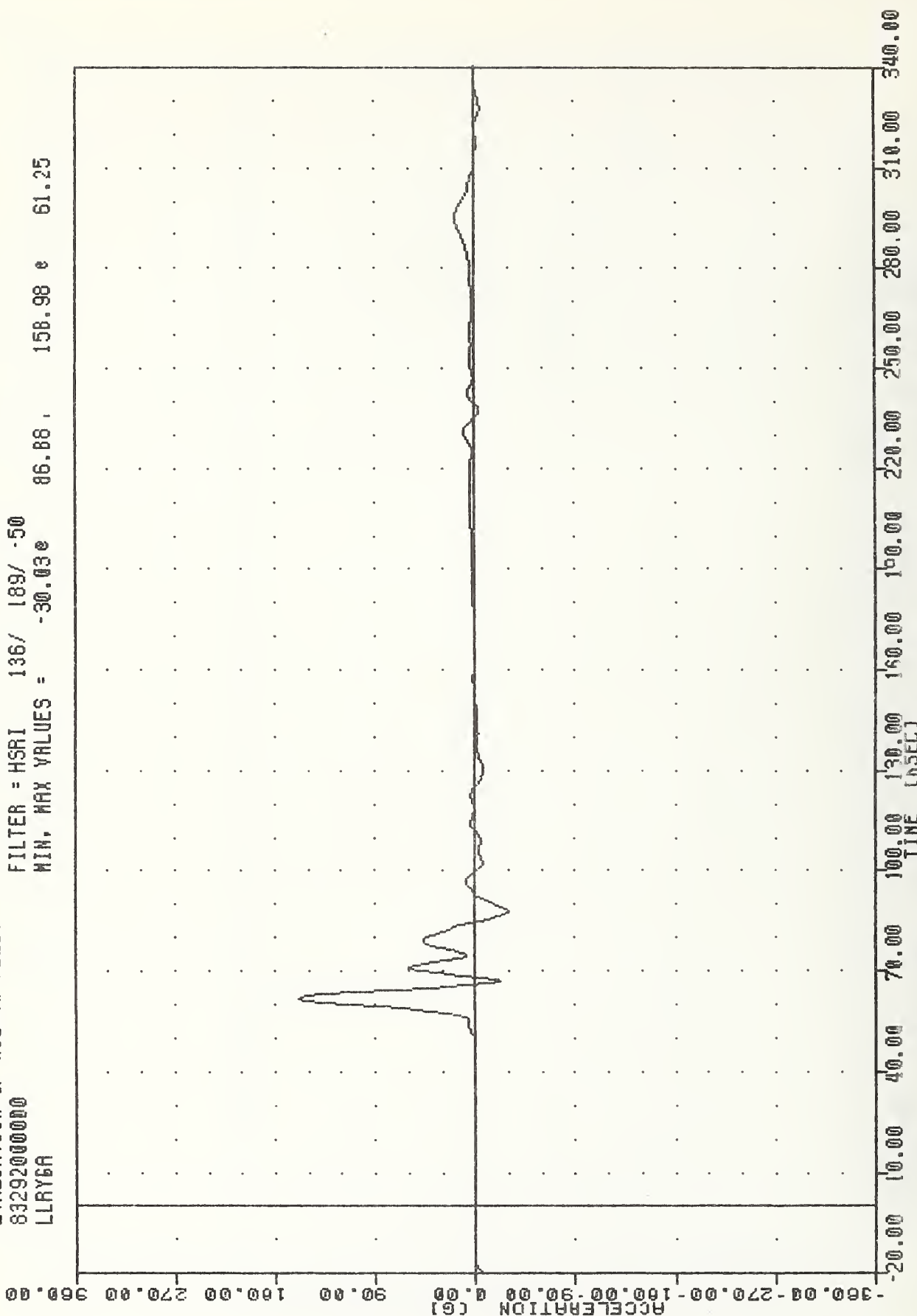
EVALUATION OF MOD VW FLEET

83292000000

LLRY6A

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -30.03e 86.88 158.98 e 61.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER LEFT LOWER RIB ACCELERATION -2 Y AXIS

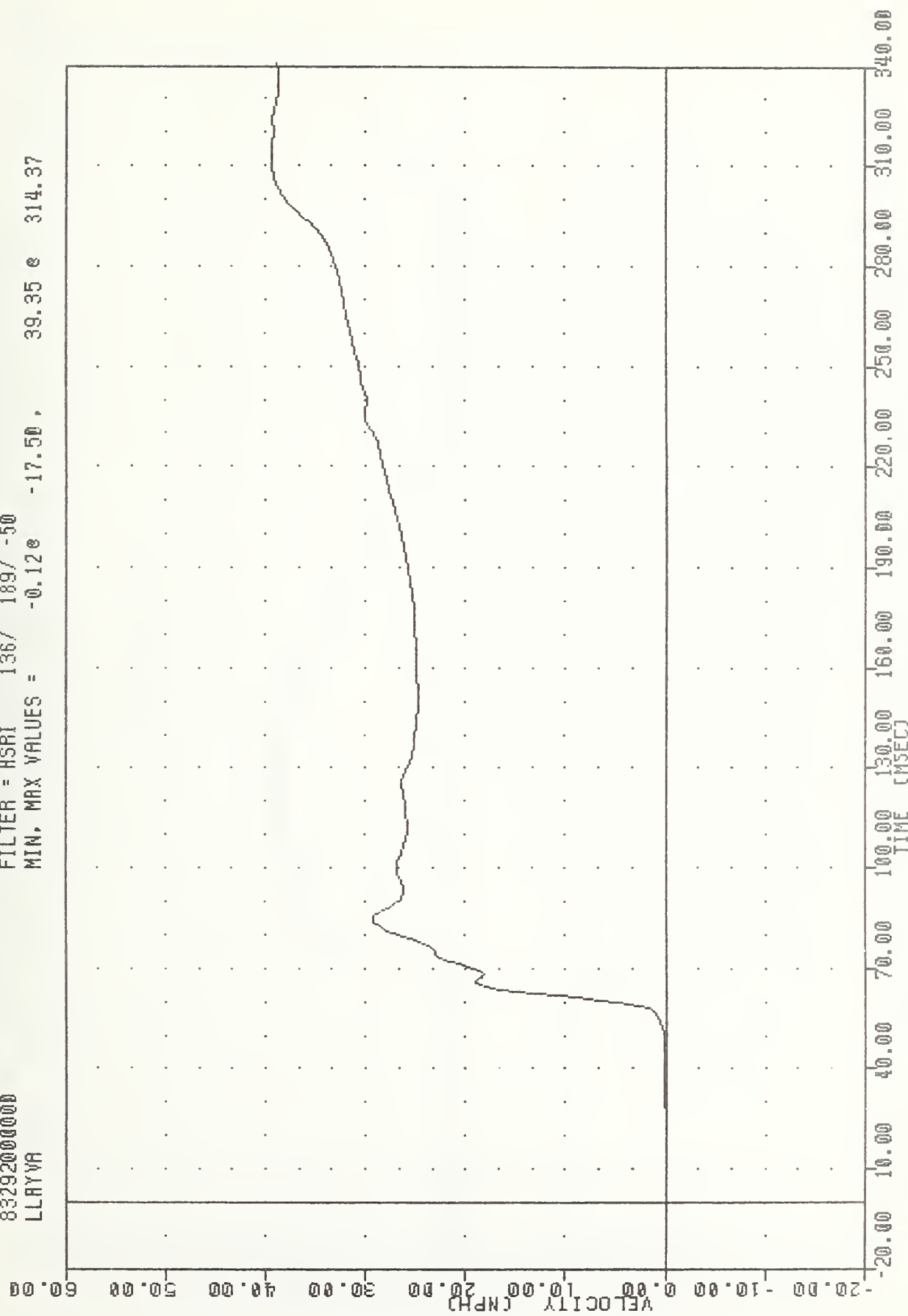
EVALUATION OF MDD VW FLEET

83292000000

LLAYVA

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.12° -17.50, 39.35 ° 314.37



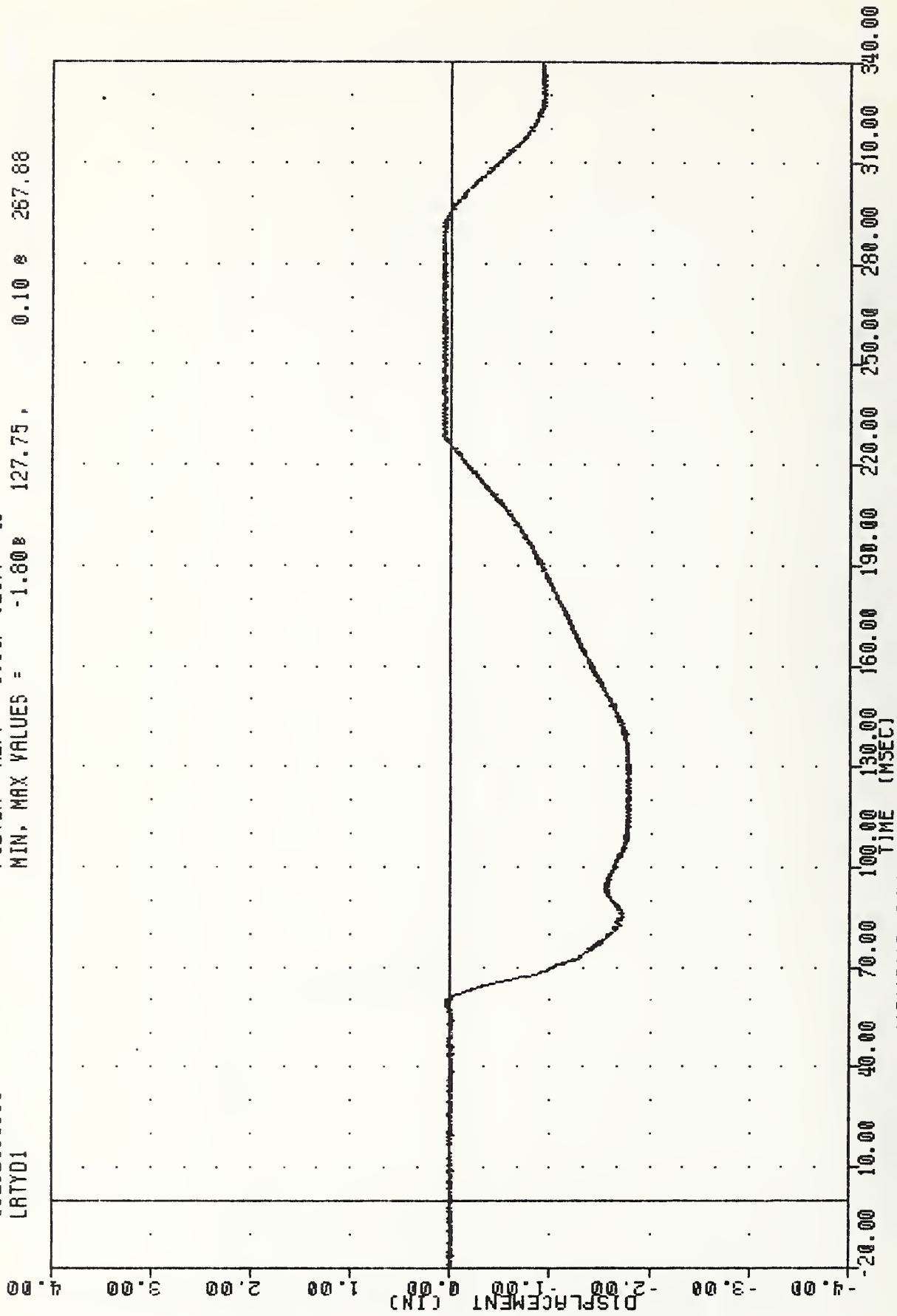
....
EVALUATION OF MOD YW FLEET

83292000000

LRTYD1

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -1.80 127.75, 0.10 267.88



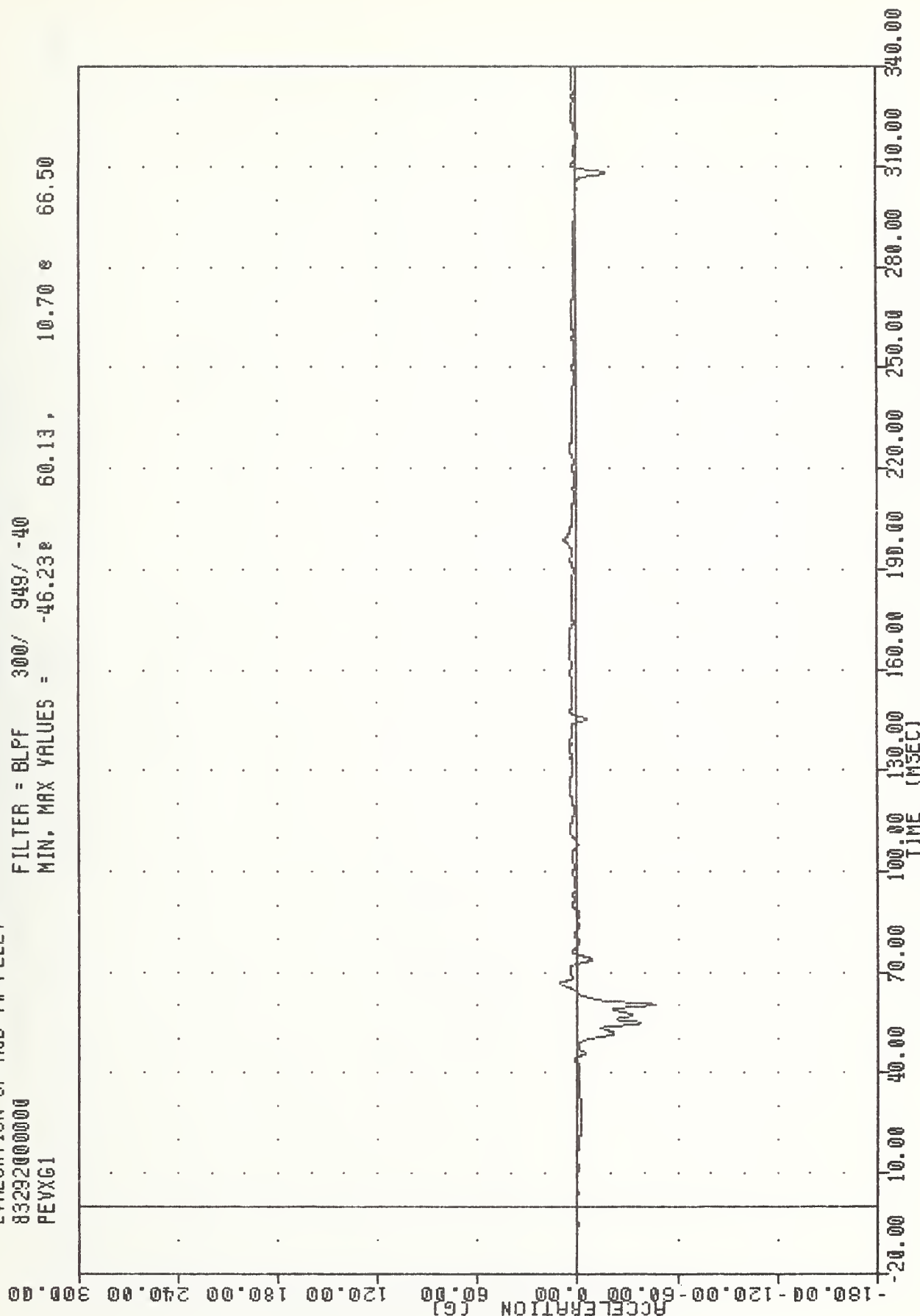
EVALUATION OF MOD VW FLEET

83292000000

PEVXG1

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -46.23e 60.13, 10.70 e 66.50



EVALUATION OF MOD VV FLEET

83292000000

PEVY61

FILTER = BLPF 300/ 949/ -40

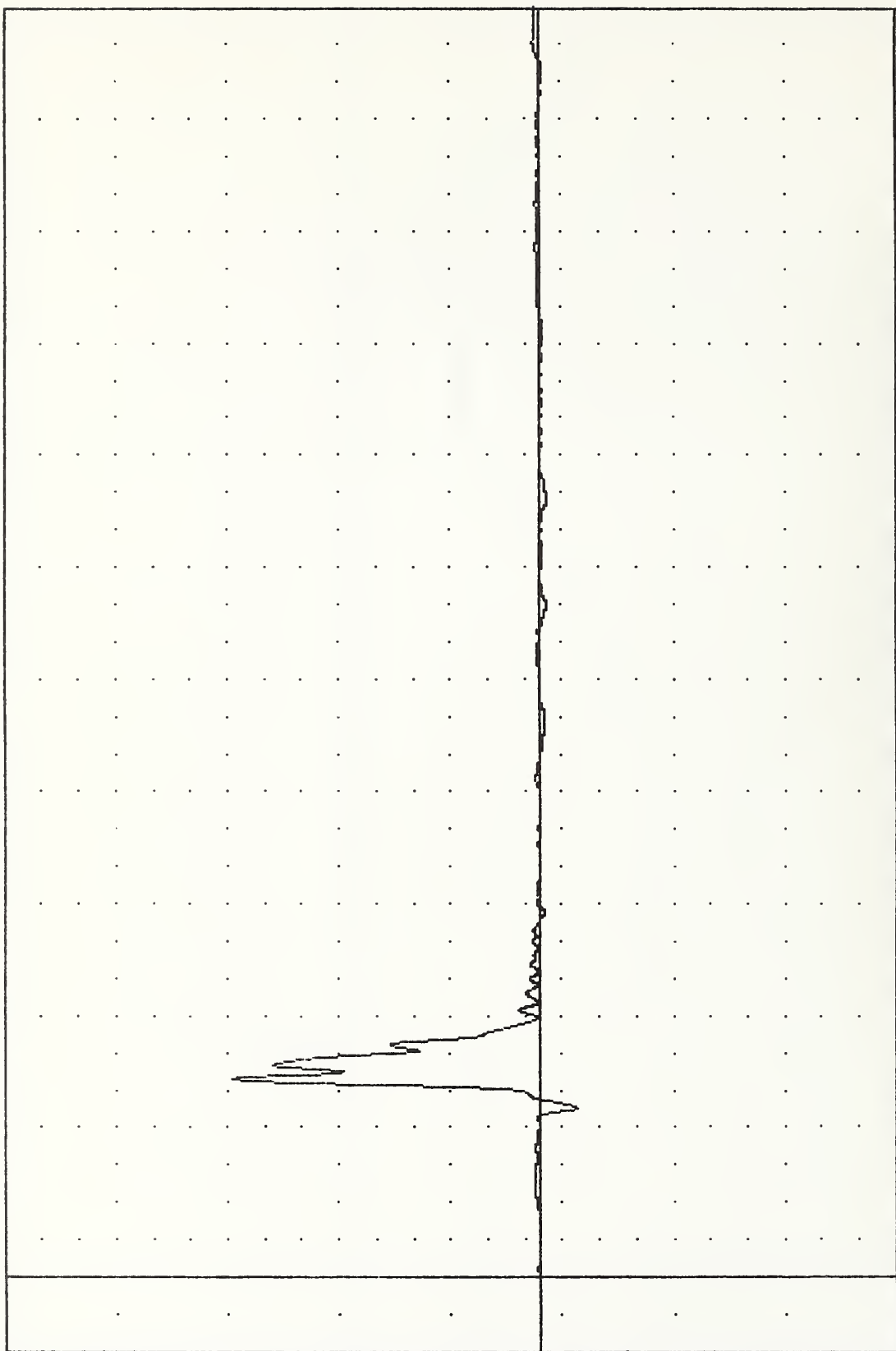
MIN, MAX VALUES = -16.51e

45.13,

137.82 e

52.88

ACCELERATION (G)

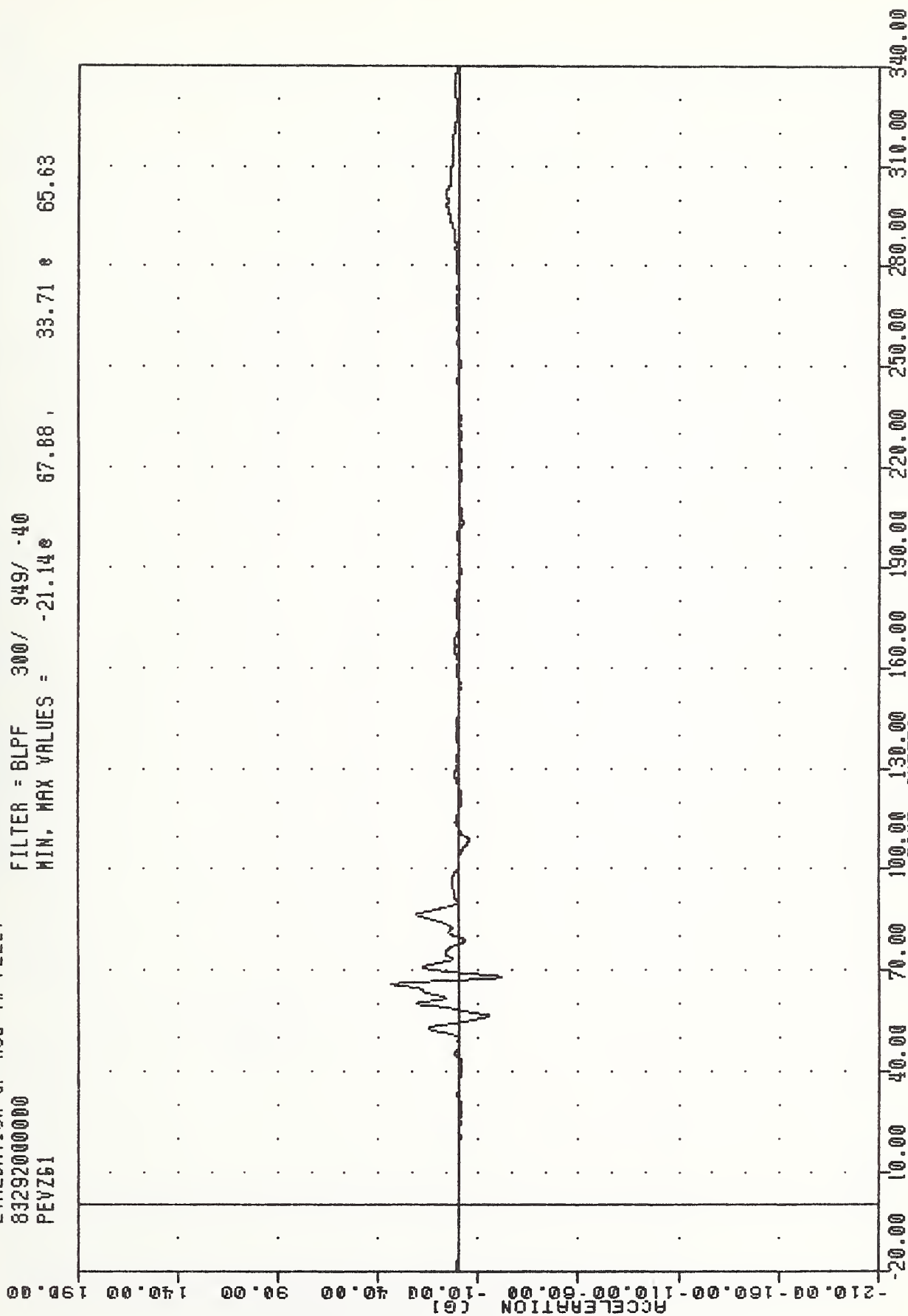


TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS ACCELERATION Y AXIS

EVALUATION OF MOD YW FLEET
 83292000000
 PEVZ61

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -21.14e 67.88 , 33.71 e 65.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DRIVER PELVIS ACCELERATION Z AXIS

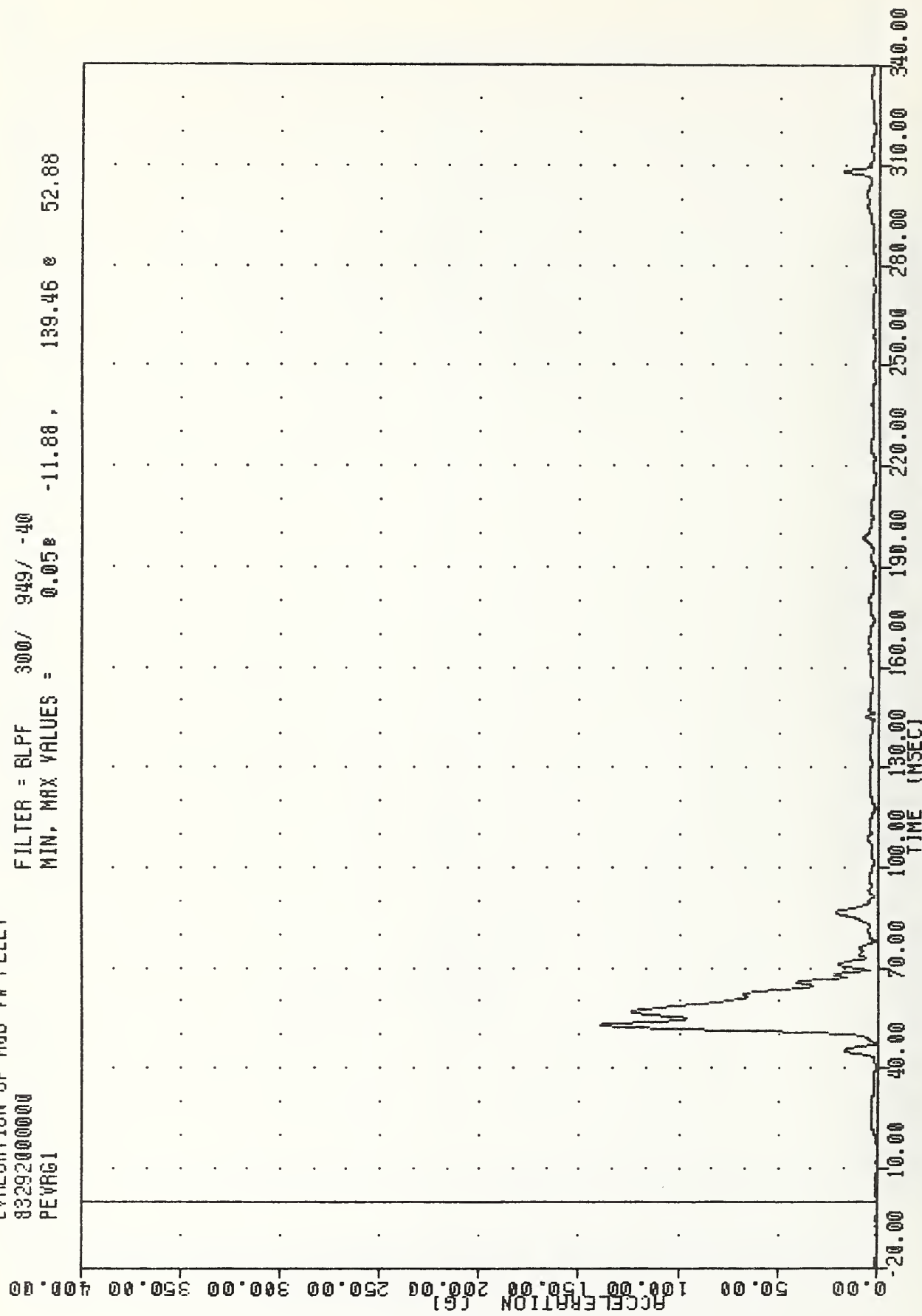
EVALUATION OF MOD YW FLEET

83292000000

PEVRG1

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.05e -11.88, 139.46 e 52.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DRIVER PELVIS RESULTANT

EVALUATION OF MOD YW FLEET

83292000000

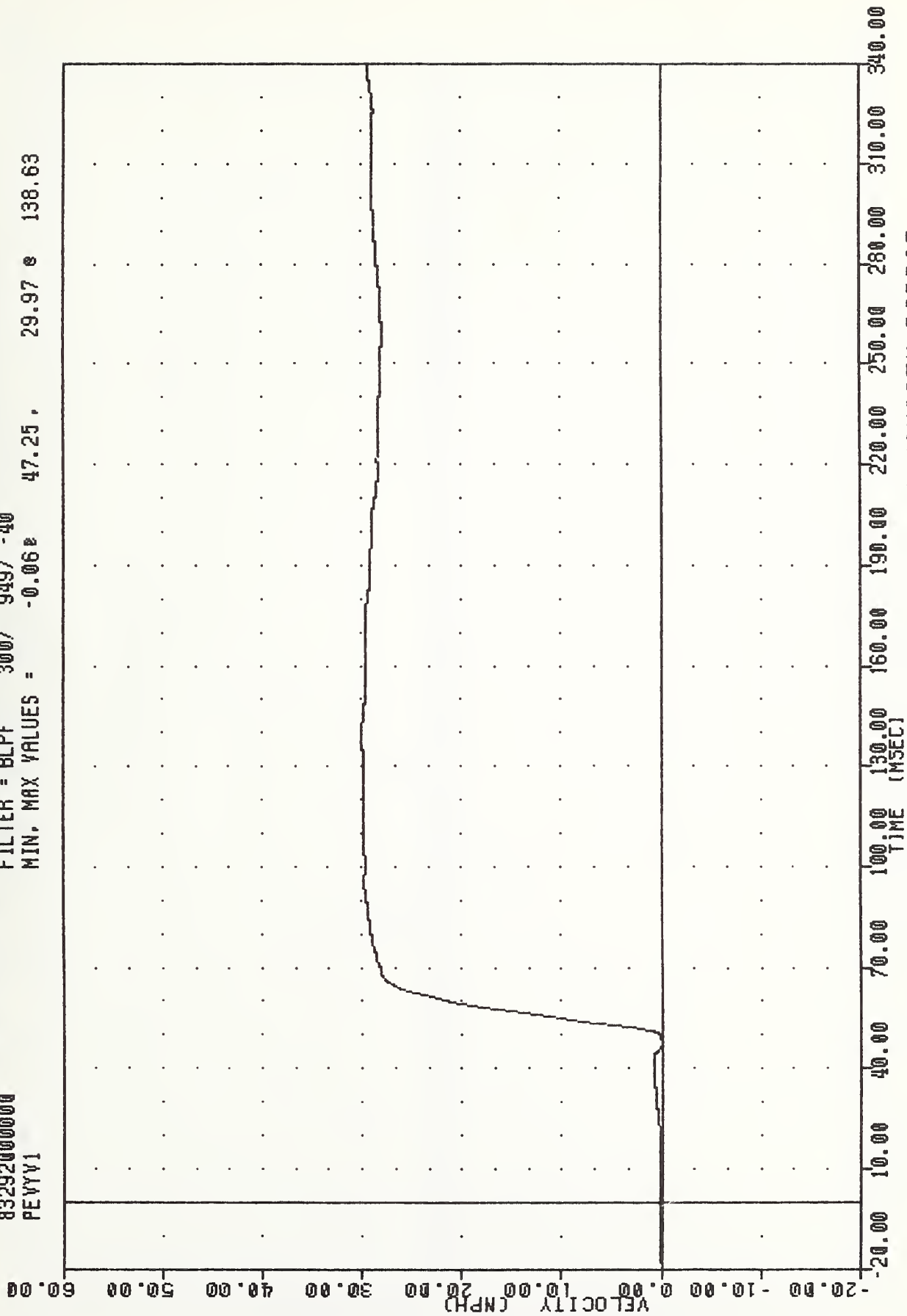
PEVYV1

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.062

47.25 .

29.97 e 138.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING PEVYG1

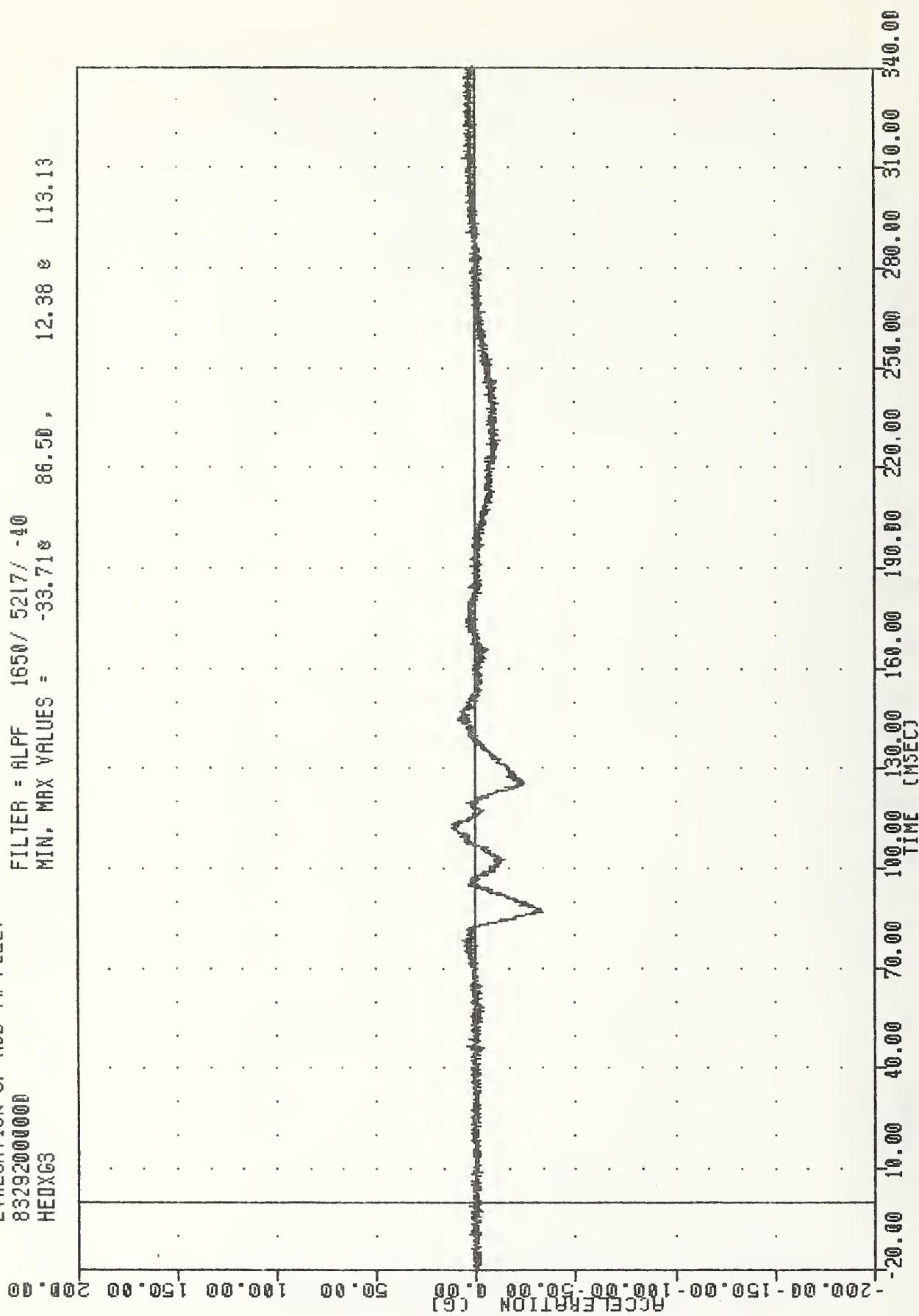
EVALUATION OF MDD VW FLEET

83292000000

HEDXG3

FILTER = ALPF 1650/ 5217/ -40

MIN, MAX VALUES = -33.71g 86.50, 12.38 g 113.13

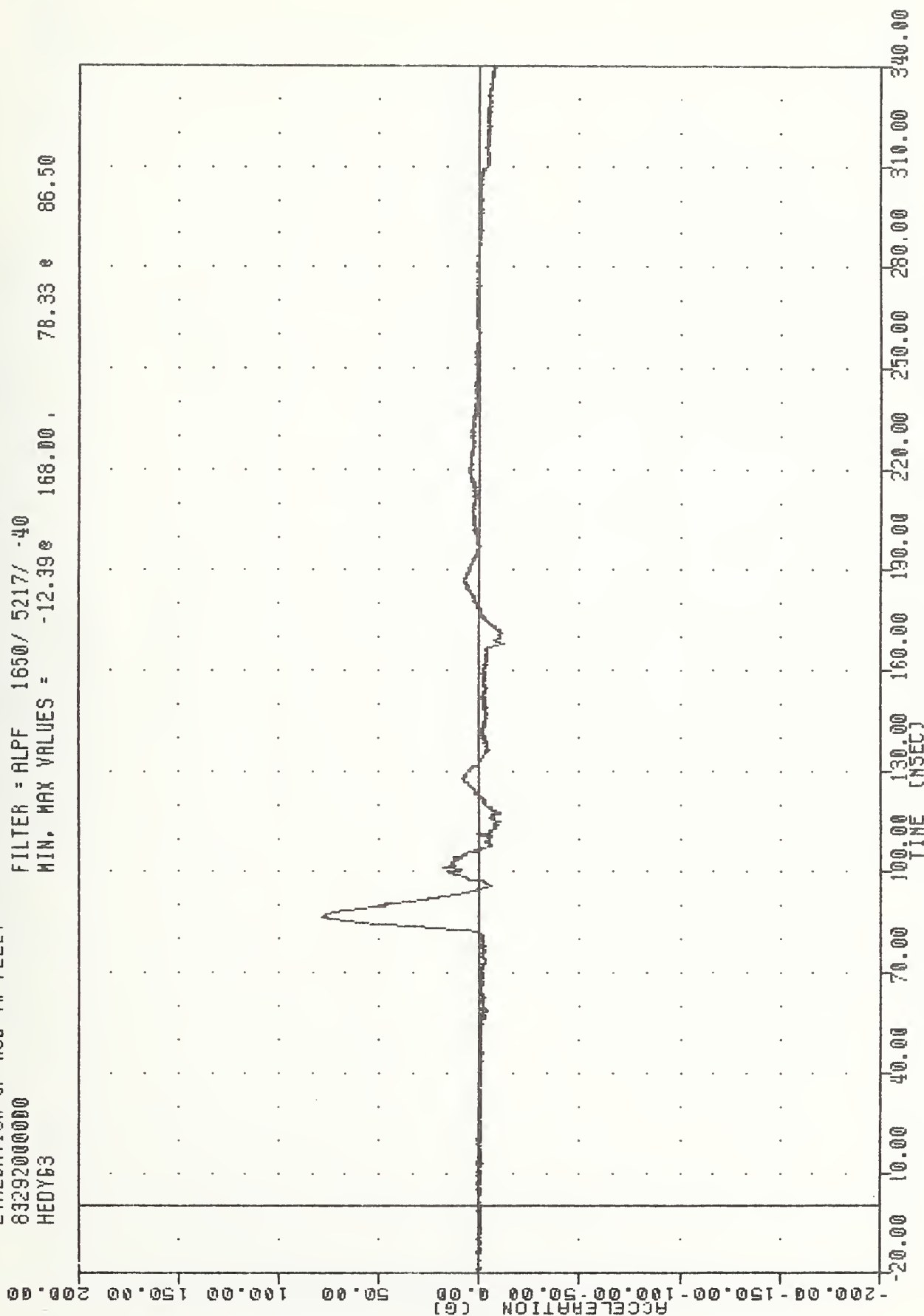


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD ACCELERATION X AXIS

EVALUATION OF MOD VW FLEET
 832920000000
 HEDY63

FILTER = ALPF 1650 / 5217 / -40
 MIN. MAX VALUES = -12.39 168.00

78.33 86.50



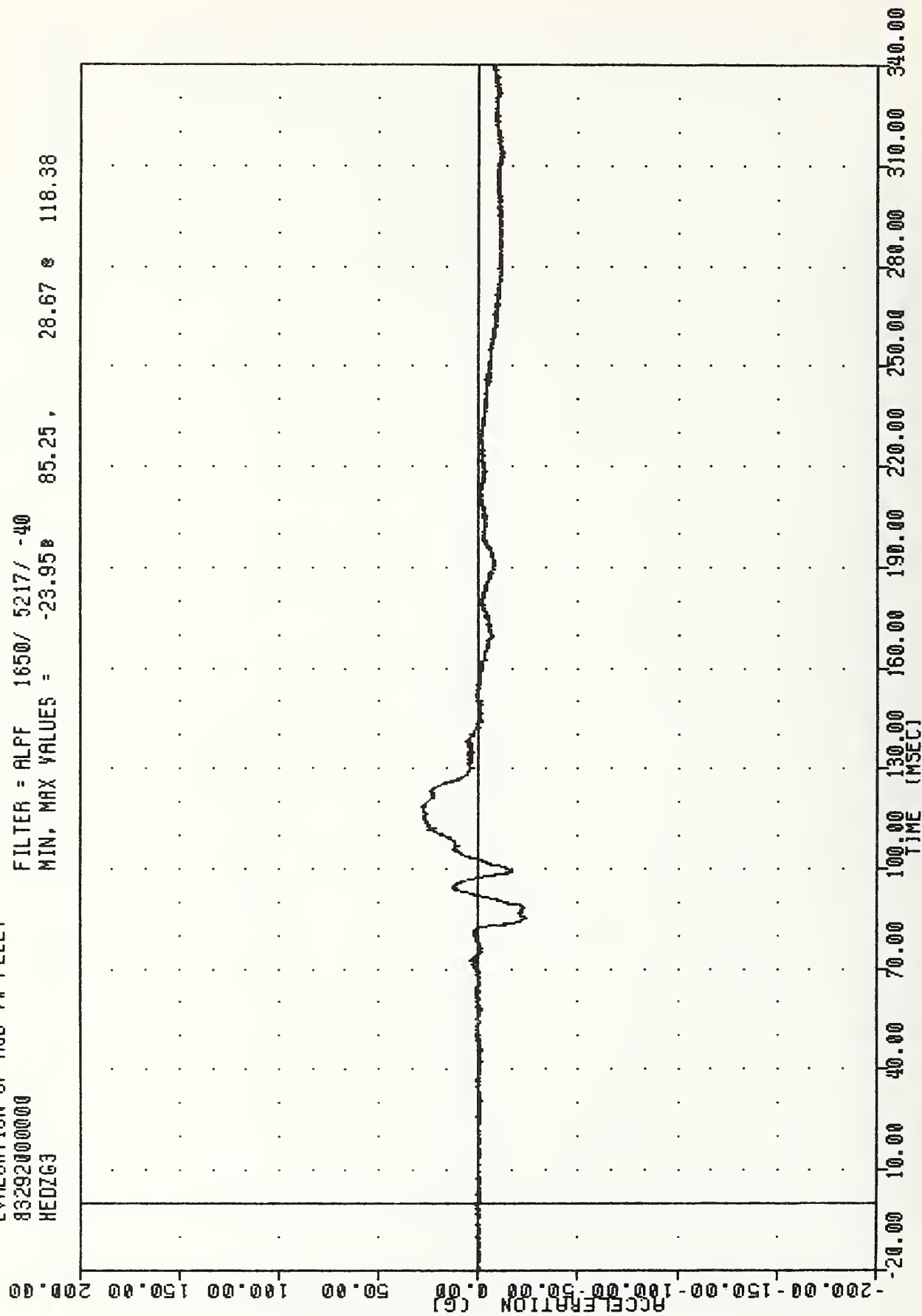
EVALUATION OF MOD VW FLEET

83292000000

HEDZG3

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -23.95 85.25, 28.67 118.38



EVALUATION OF MOD VW FLEET

83292000000

HEAD63

FILTER = ALPF 1650/ 5217/ -40

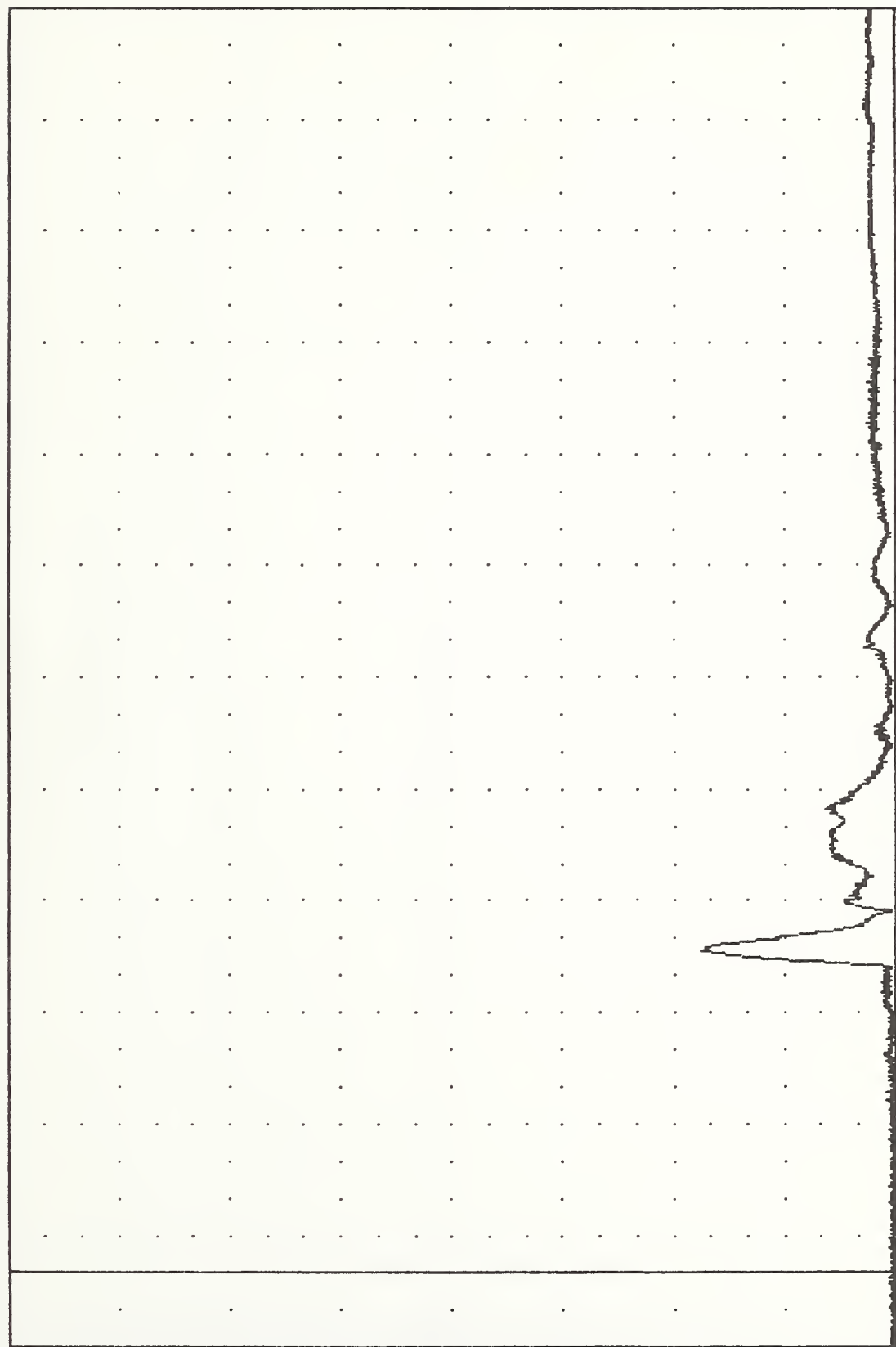
MIN. MAX VALUES = 0.11 e

34.63 ,

87.90 e

86.50

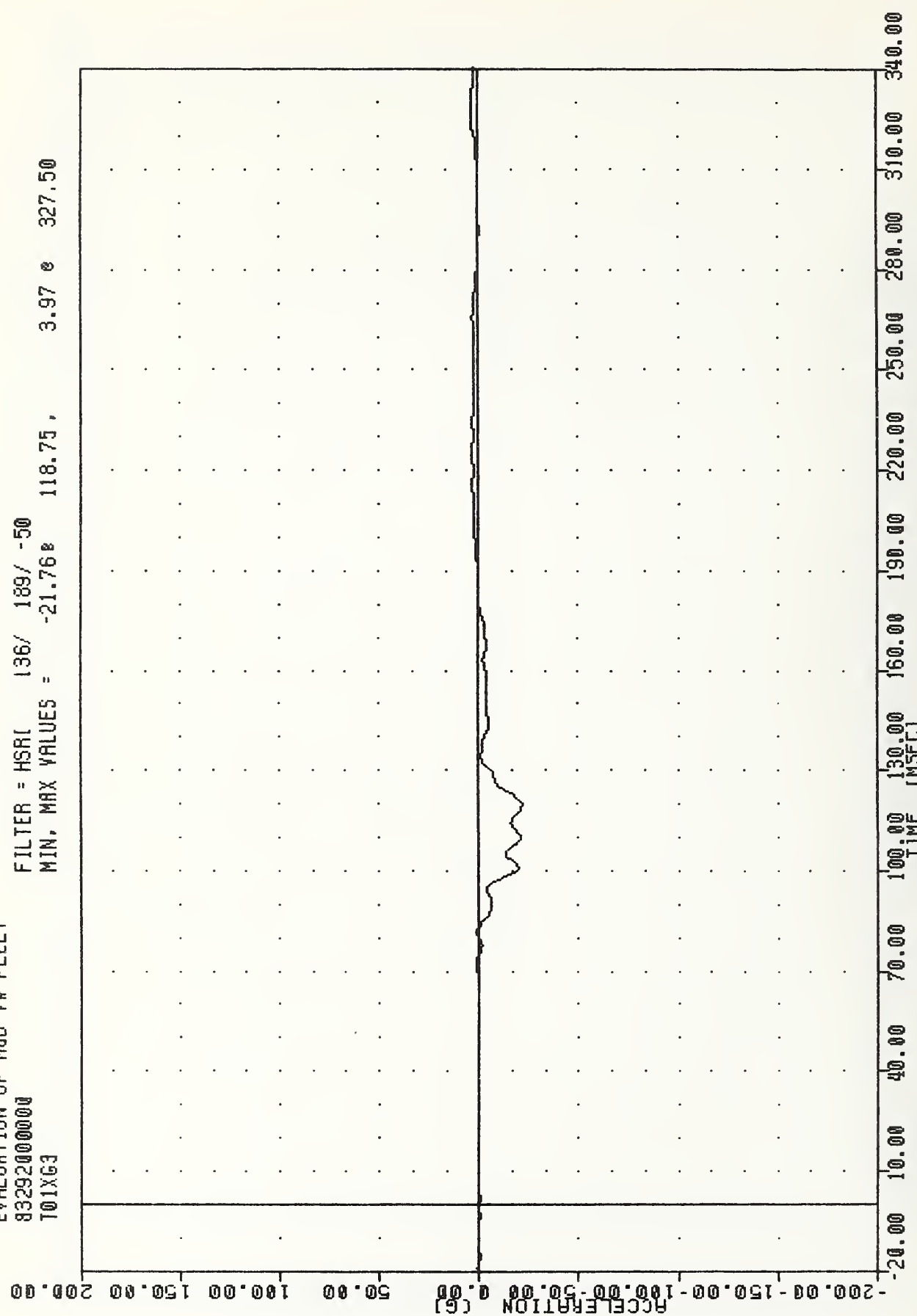
ACCELERATION (G)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER HEAD RESULTANT

EVALUATION OF MOD VW FLEET
 83292000000
 T01XG3

FILTER = HSRI 136/ 189/ -50
 MIN, MAX VALUES = -21.76g 118.75, 3.97 g 327.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER UPPER SPINE ACCELERATION X AXIS

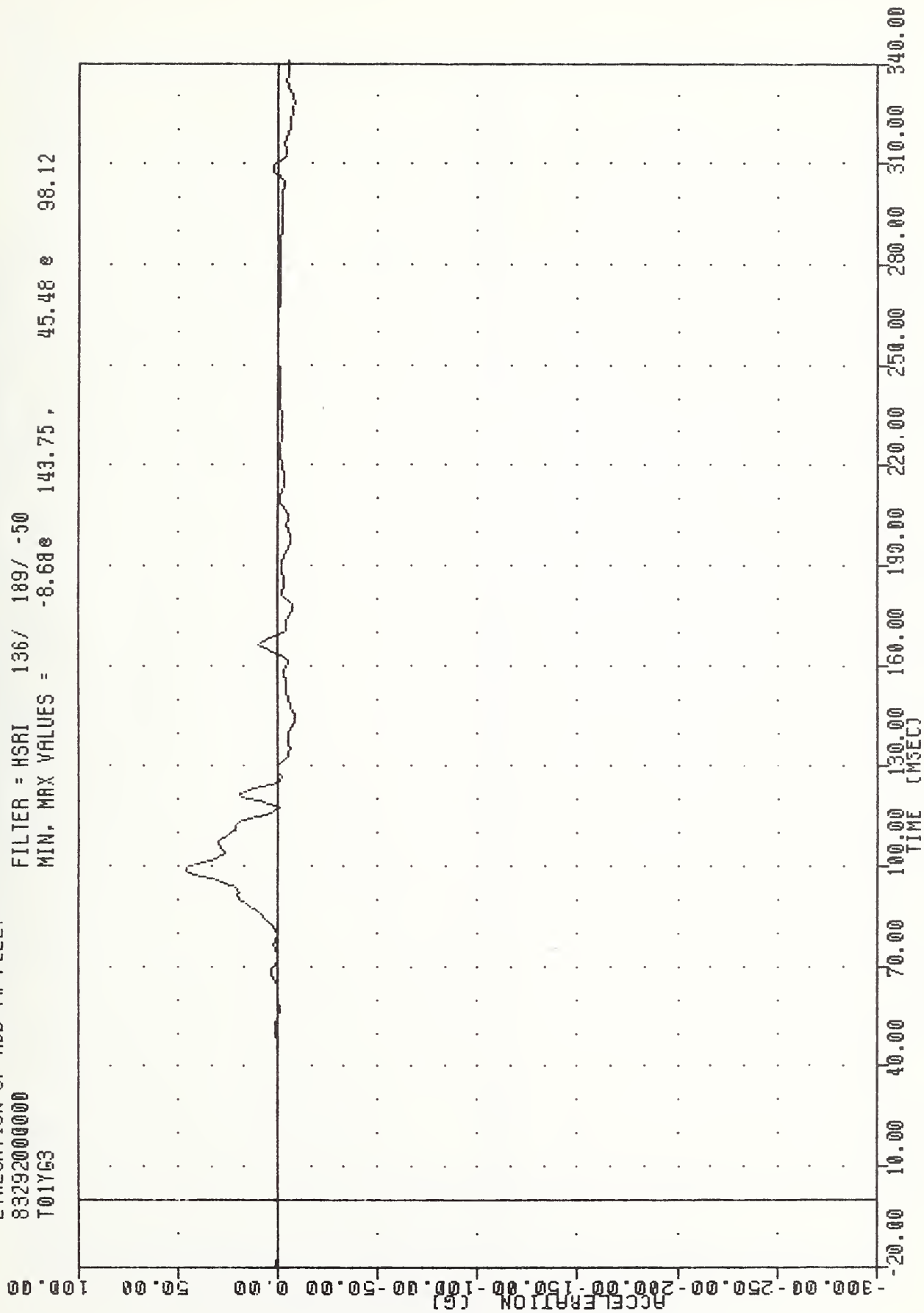
EVALUATION OF MDD VW FLEET

83292000000

T01Y63

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -8.68e 143.75 , 45.48 e 98.12



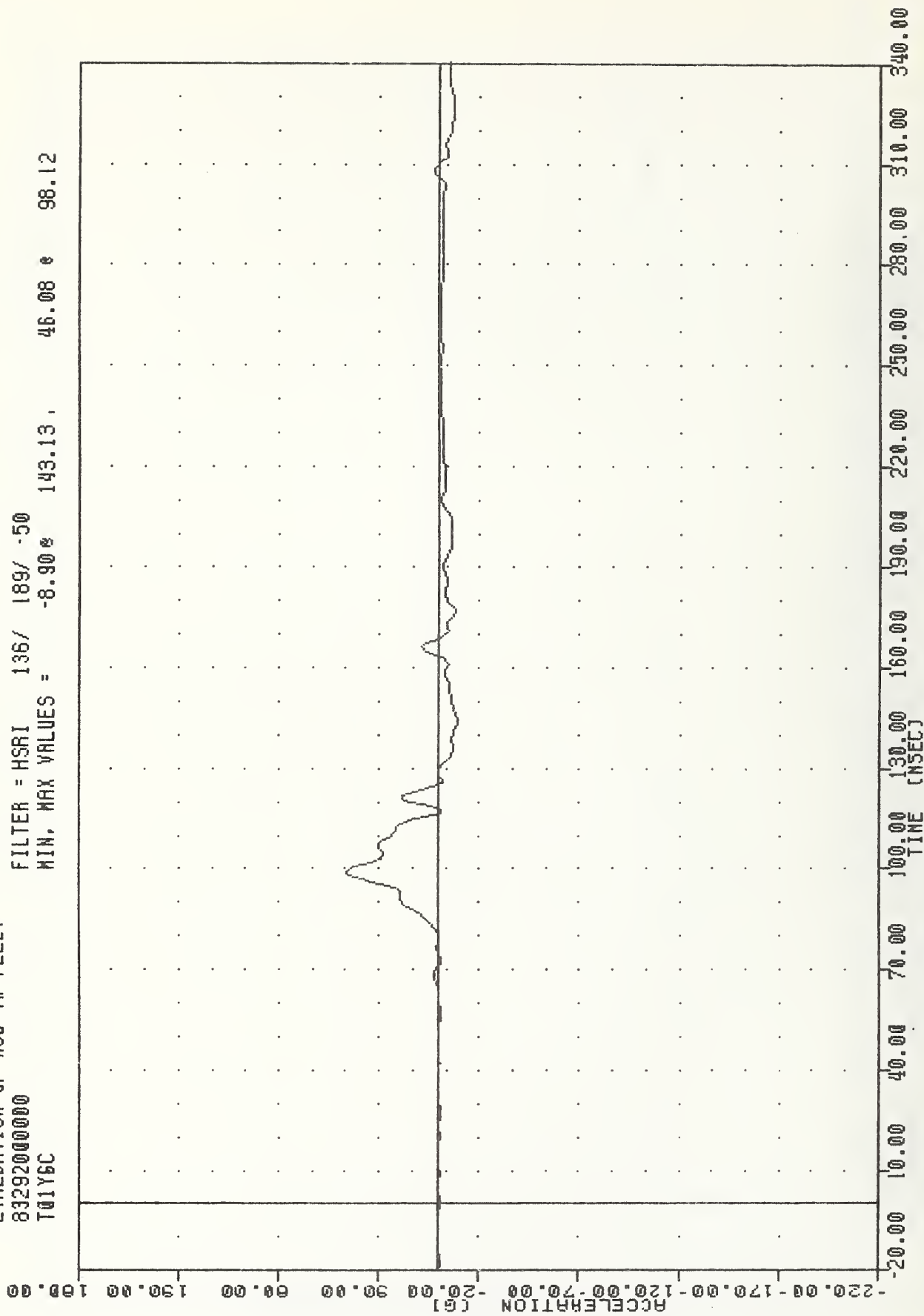
EVALUATION OF MOD YW FLEET

83292000000

T01Y6C

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -8.90 s 143.13 , 46.08 e 98.12



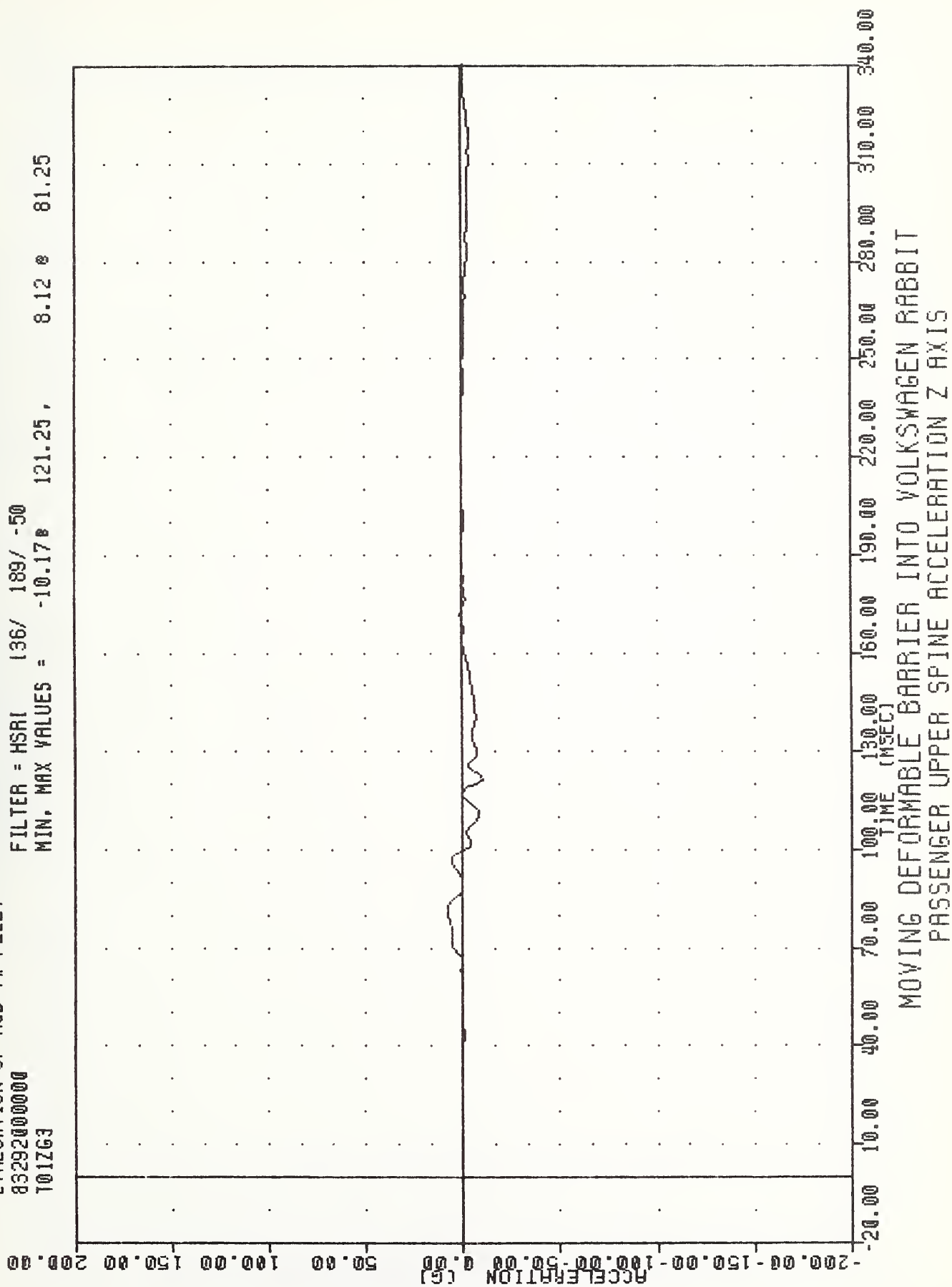
EVALUATION OF MOD YW FLEET

83292000000

101763

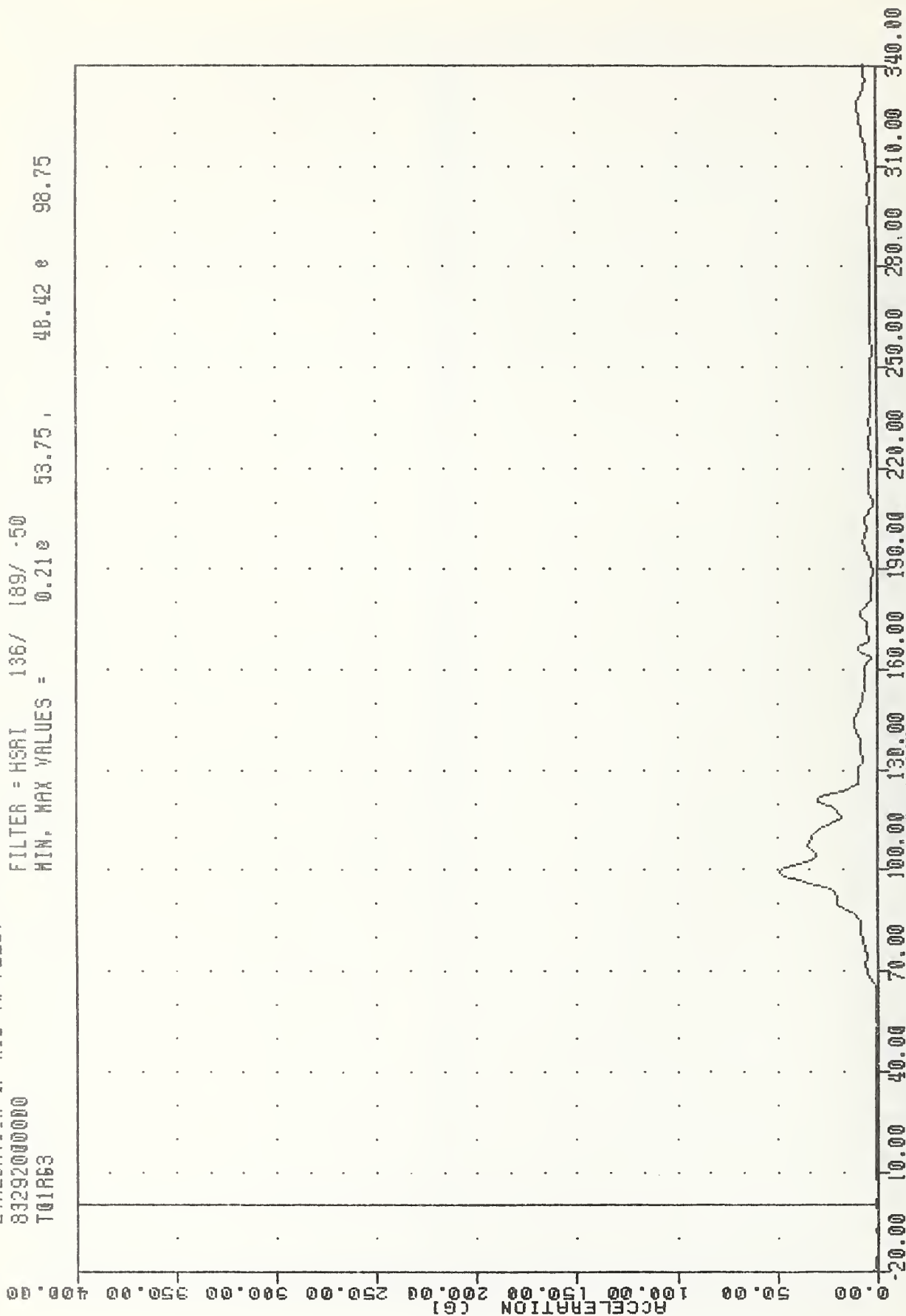
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -10.17 121.25, 8.12 81.25



EVALUATION OF MOD VN FLEET
83292000000
T01R63

FILTER = HSRI 136/ 189/ .50
MIN. MAX VALUES = 0.21e 53.75 , 48.42 e 98.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE RESULTANT

EVALUATION OF MOD VV FLEET

832920000000

T01R63

FILTER = HSRI 136/ 189/ .50

MIN, MAX VALUES = 0.18e

5.00 ,

49.12 e

98.75

ACCELERATION [G]



TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER UPPER SPINE RESULTANT USING T01YGC

EVALUATION OF MOD VW FLEET

83292000000

T01YV3

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.07e

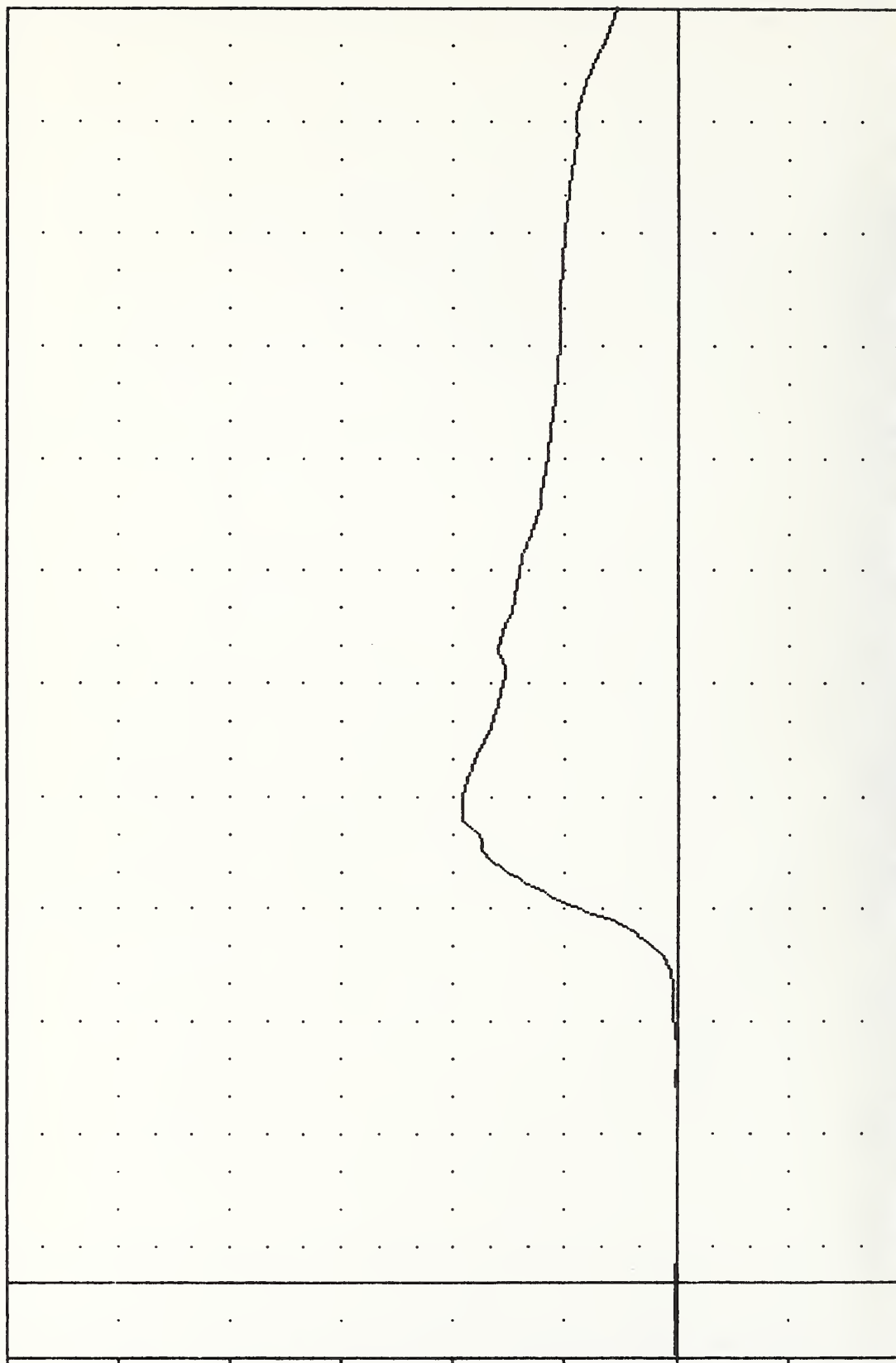
32.50 ,

19.21 e

124.38

VELOCITY (MPH)

60.00 50.00 40.00 30.00 20.00 10.00 0.00 -10.00 -20.00



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING T01YV3

EVALUATION OF MOD YW FLEET

83292000000

T01YVC

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.048

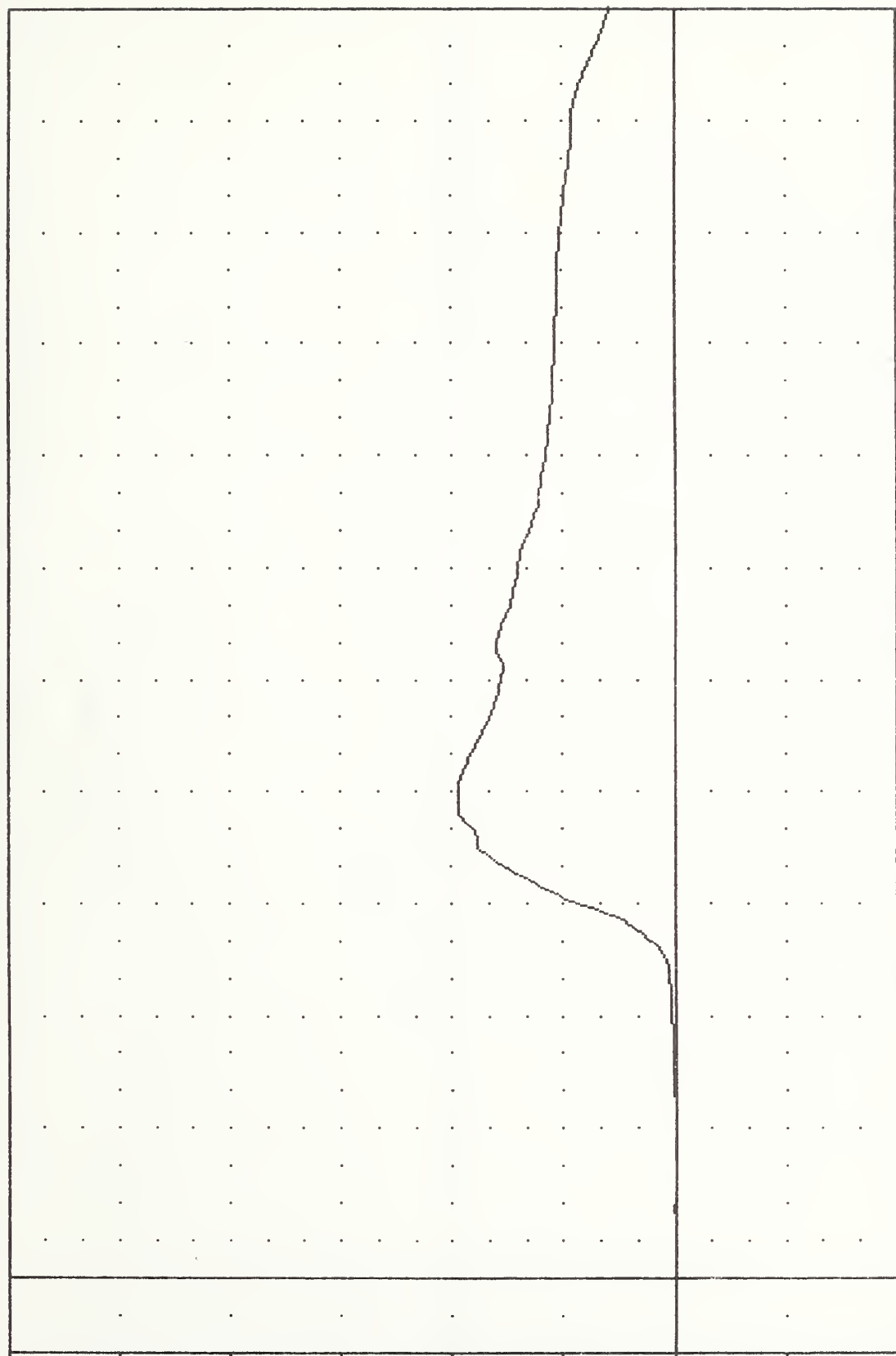
10.63,

19.47 @

124.38

VELOCITY (MPH)

B-47



-20.00 10.00 20.00 30.00 40.00 50.00 60.00

TIME (MSEC)

-20.00 10.00 20.00 30.00 40.00 50.00 60.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING T01YGC

EVALUATION OF MDD VW FLEET

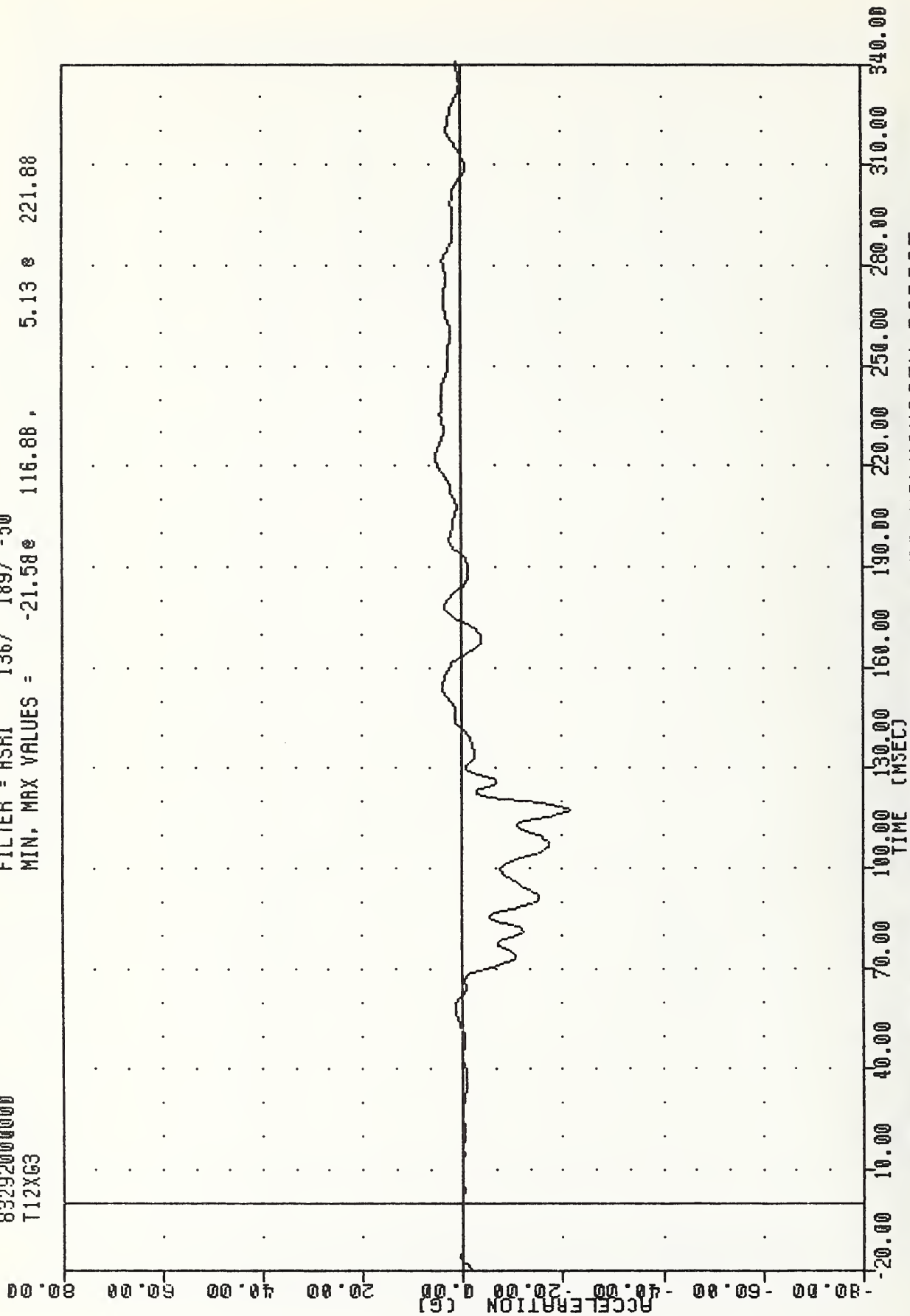
83292000000

T12XG3

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = -21.58e 116.88 ,

5.13 s 221.88



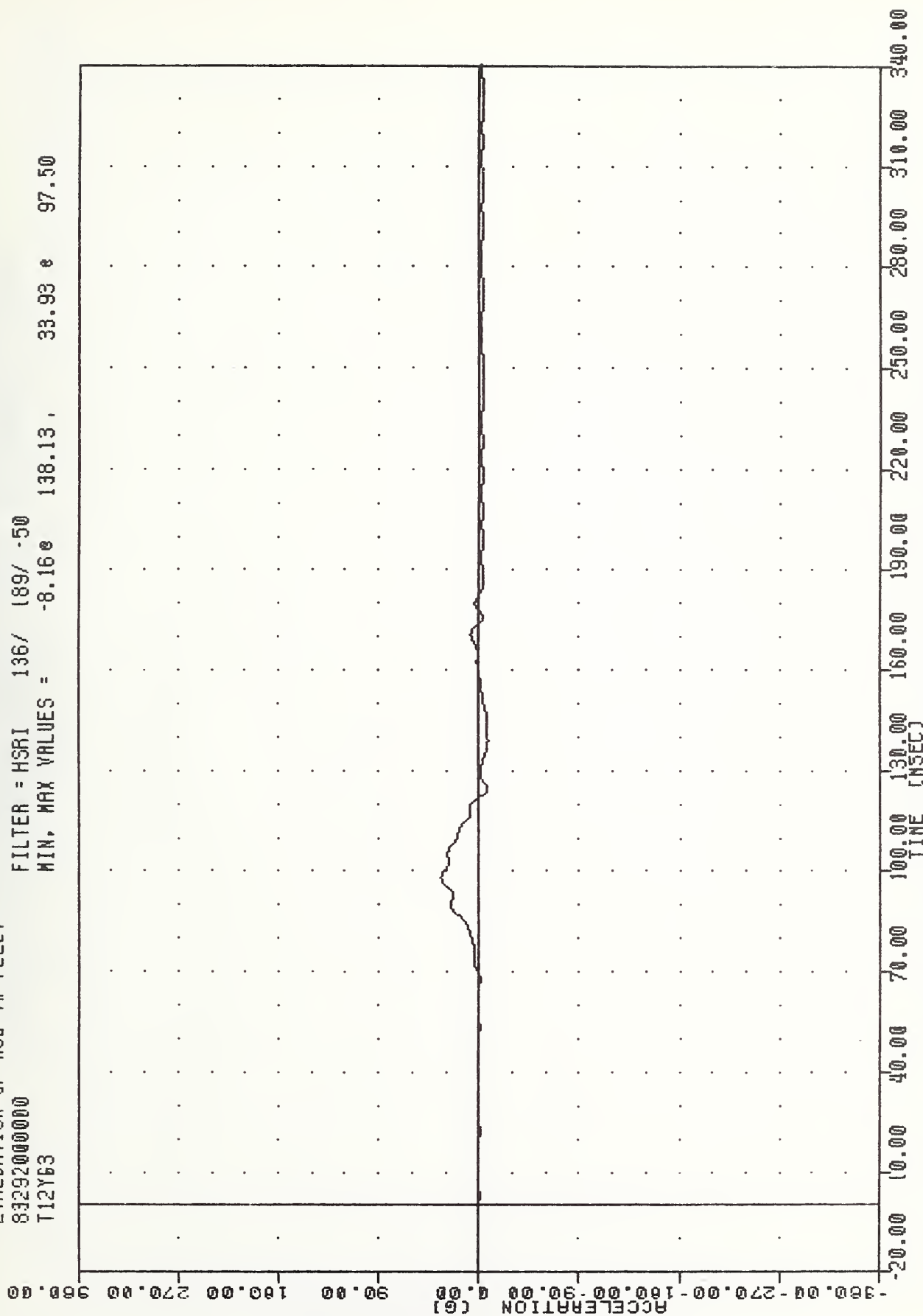
EVALUATION OF MOD VW FLEET

83292000000

T12Y63

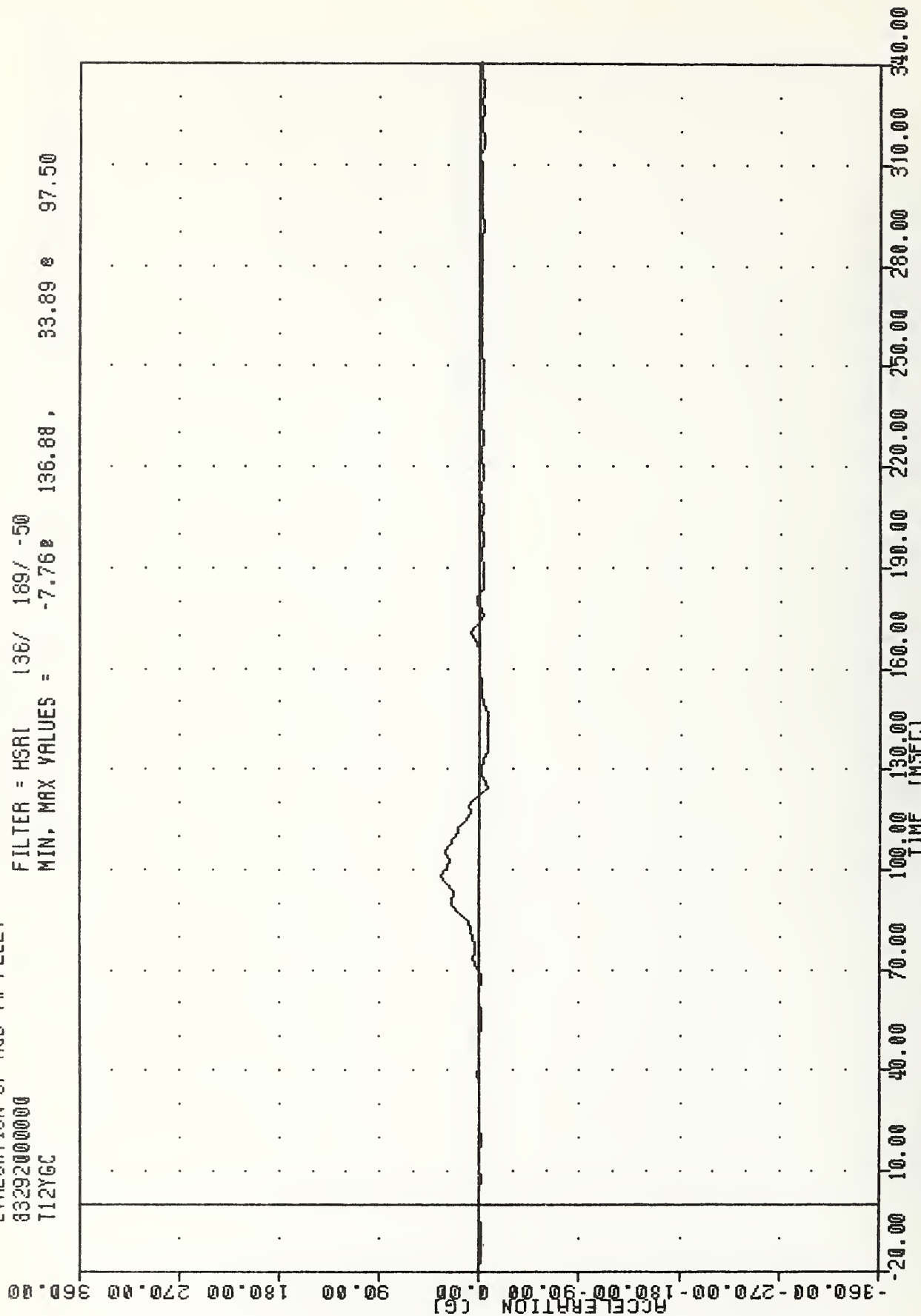
FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -8.16e 138.13, 33.93 e 97.50



EVALUATION OF MOD VW FLEET
 83292000000
 T12Y6C

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -7.76 136.88 , 33.89 97.50



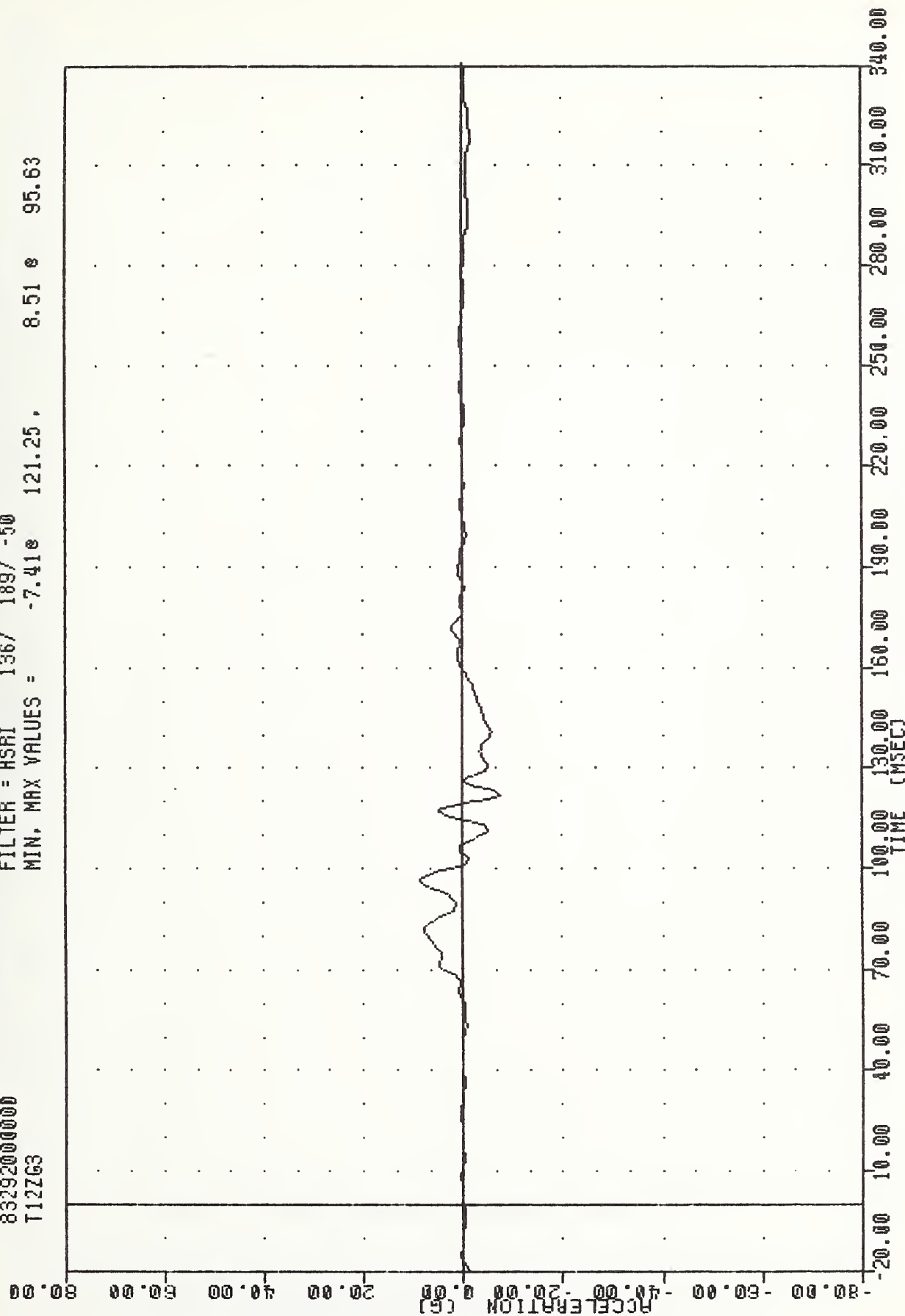
EVALUATION OF MDD VV FLEET

83292000000

T12763

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -7.41e 121.25, 8.51 e 95.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LOWER SPINE ACCELERATION Z AXIS

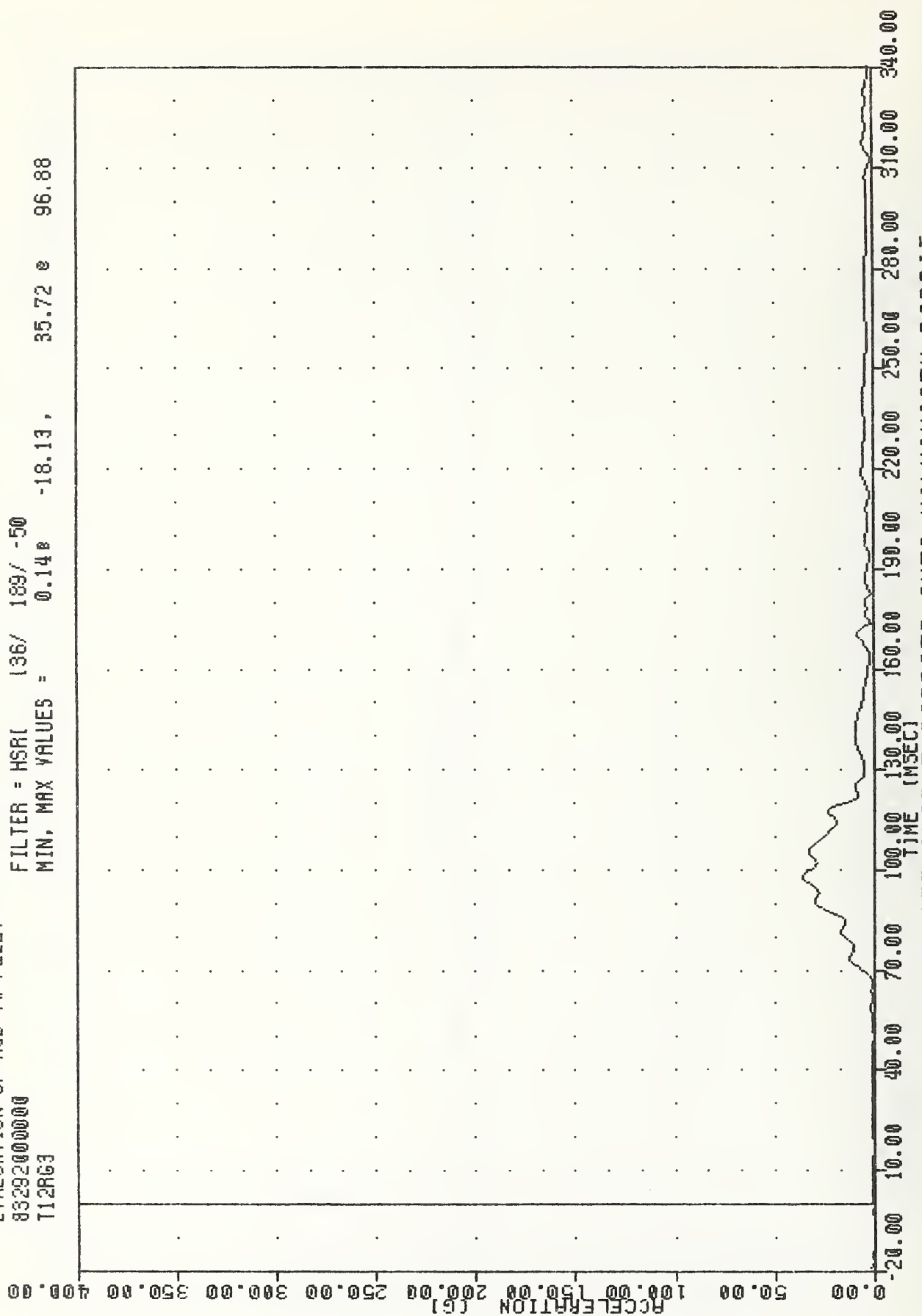
EVALUATION OF MOD YW FLEET

852920000000

T12R63

FILTER = HSR1 136/ 189/ -50

MIN, MAX VALUES = 0.148 -18.13, 35.72 e 96.88

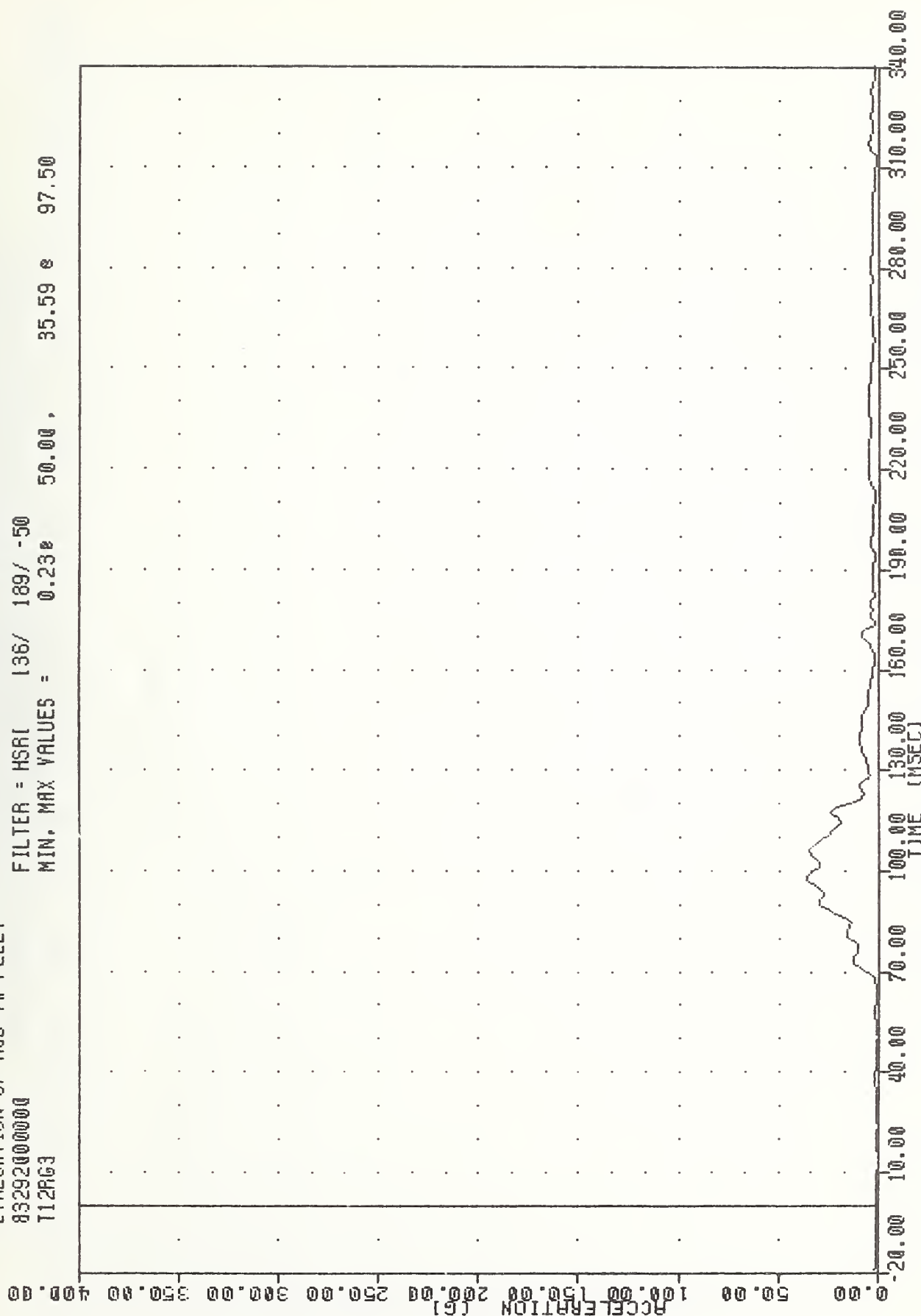


TRC 831019
 EVALUATION OF MOD VW FLEET
 83292000000
 T12PG3

PLOT DATE 24-OCT-83 08:18:36

FILTER = HSR 136/ 189/ -50

MIN, MAX VALUES = 0.23e 50.00, 35.59 e 97.50



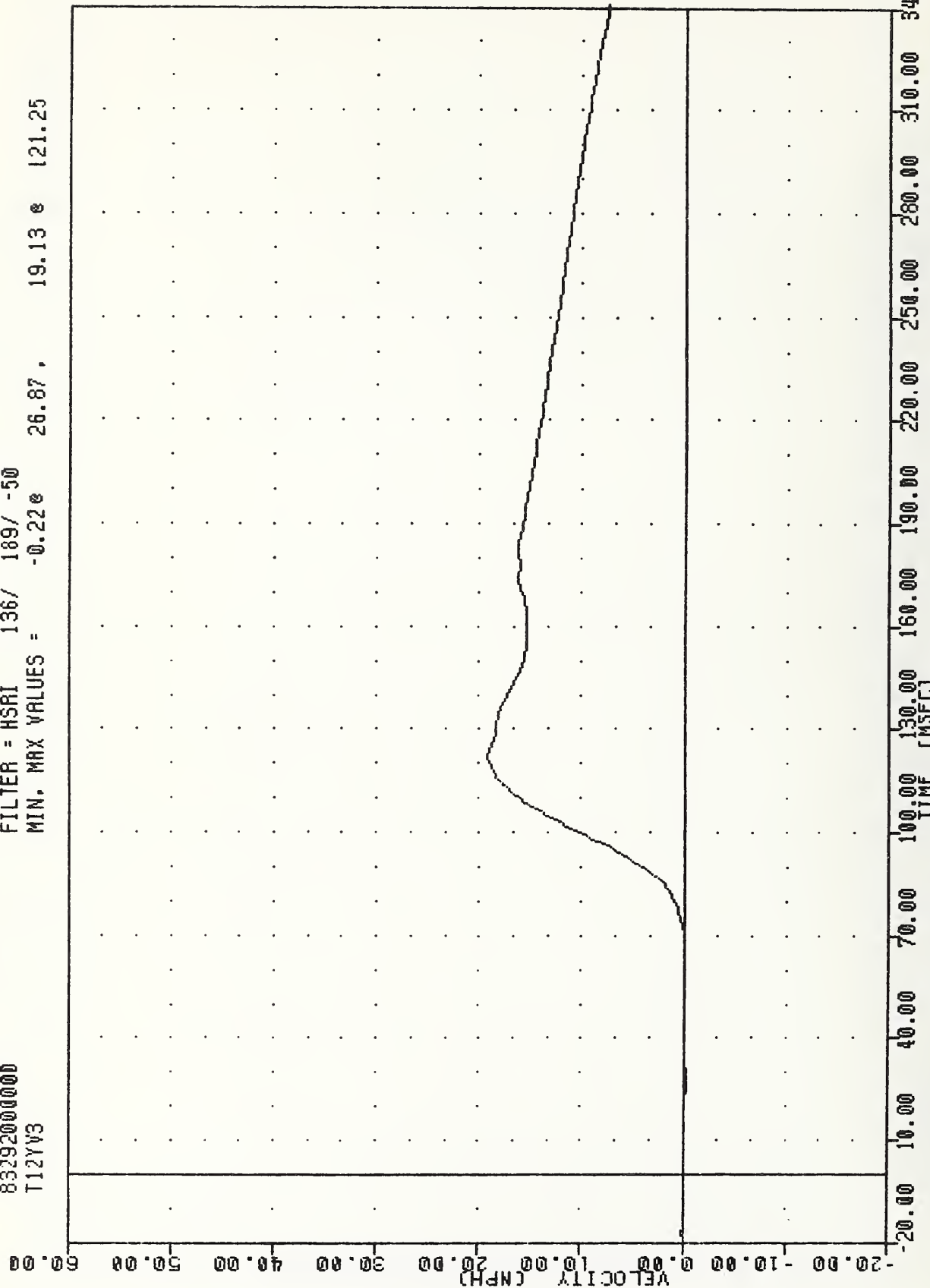
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LOWER SPINE RESULTANT USING T12YGC

TRC , 831019
 EVALUATION OF MOD VV FLEET
 83292000000
 T12YV3

PLUT DATE 24-OCT-83 10:53:52

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.22 26.87 , 19.13 121.25



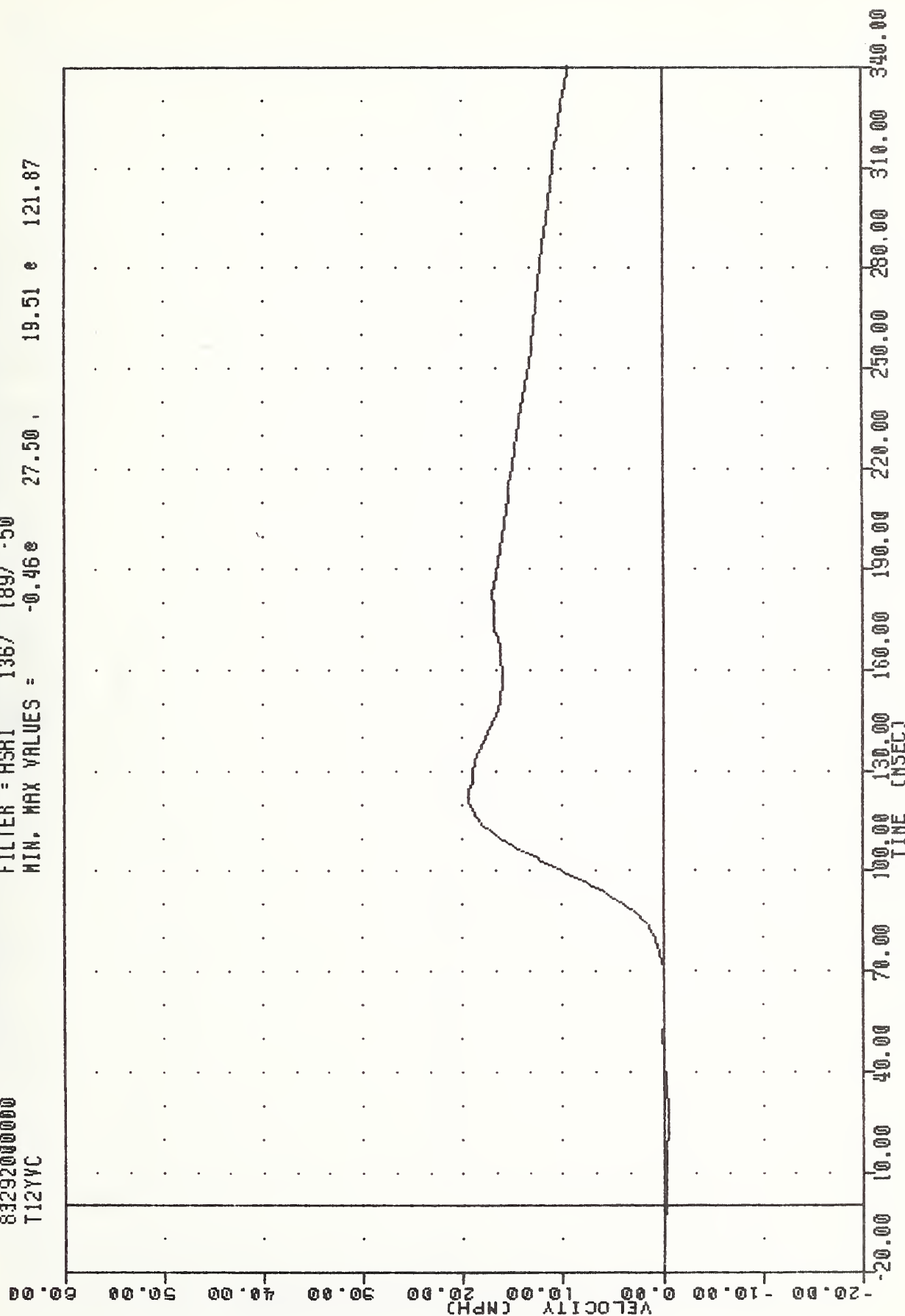
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12Y63

TRC , 831019
 EVALUATION OF MOD VN FLEET
 83292000000
 T12YVC

PLOT DATE 24-OCT-83 10:53:52

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.46e 27.50 , 19.51 e 121.87



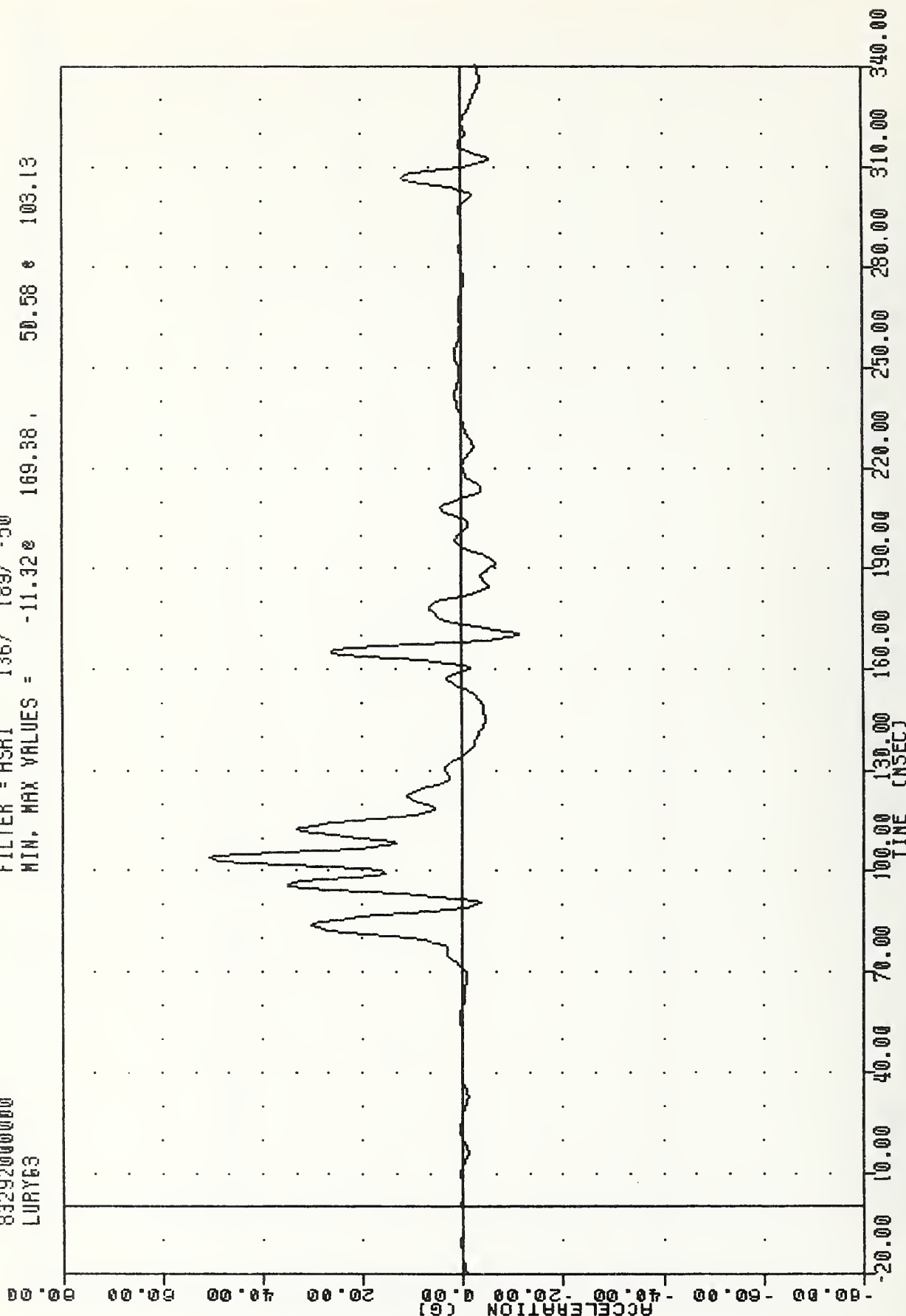
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING T12YGC

TAC , 831019
 EVALUATION OF MOD VN FLEET
 832920000000
 LURVE3

PLOT UNIT 24-OCT-83 08:17:40

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -11.32e 169.38 , 50.58 e 103.13



B-56

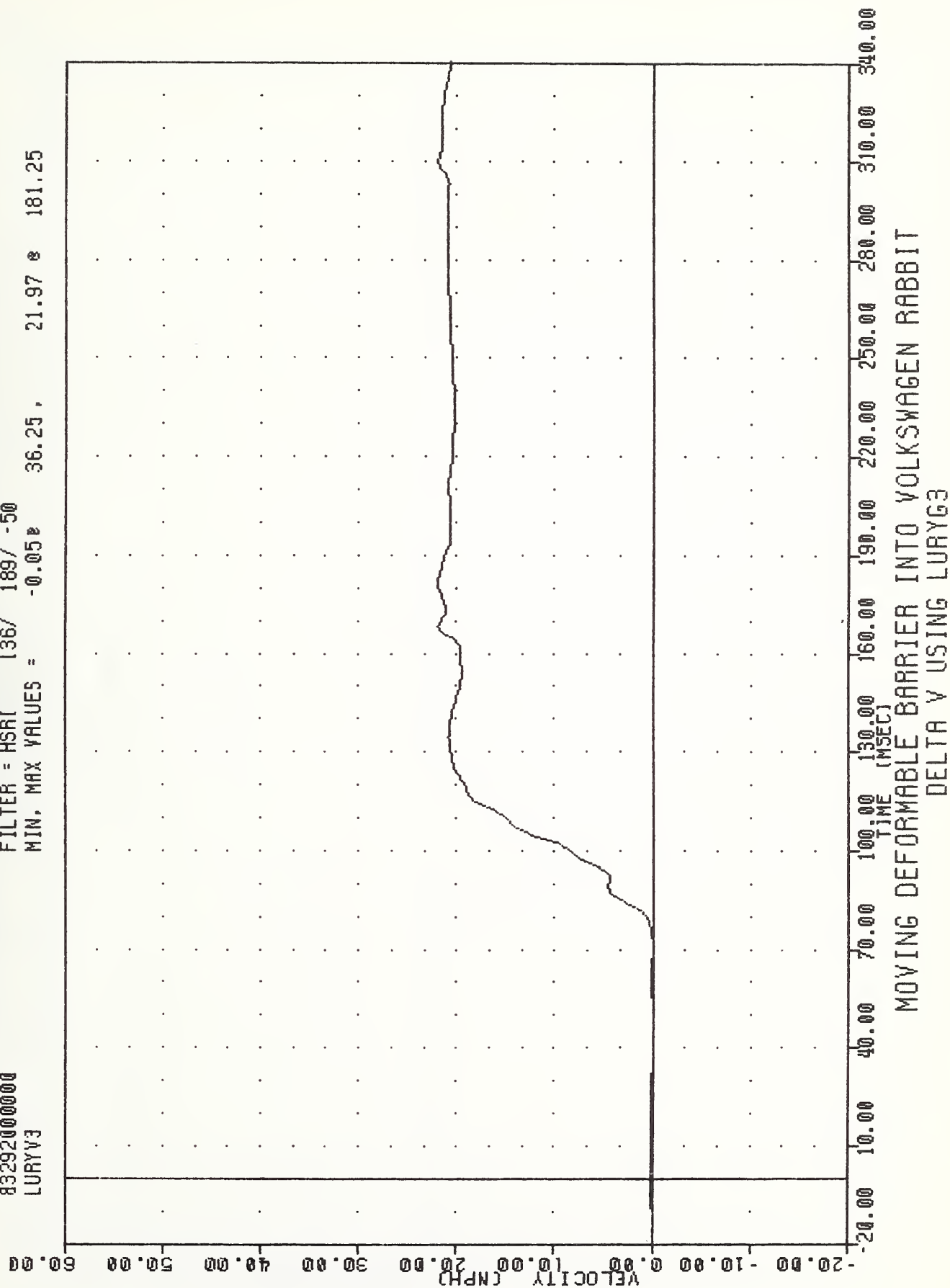
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LEFT UPPER RIB ACCELERATION Y AXIS

TRC 831019
EVALUATION OF MOD YW FLEET
83292000000
LURYV3

PLOT DATE 24-OCT-83 10:53:52

FILTER = HSR1 136/ 189/ -50

MIN. MAX VALUES = -0.05 36.25, 21.97 181.25



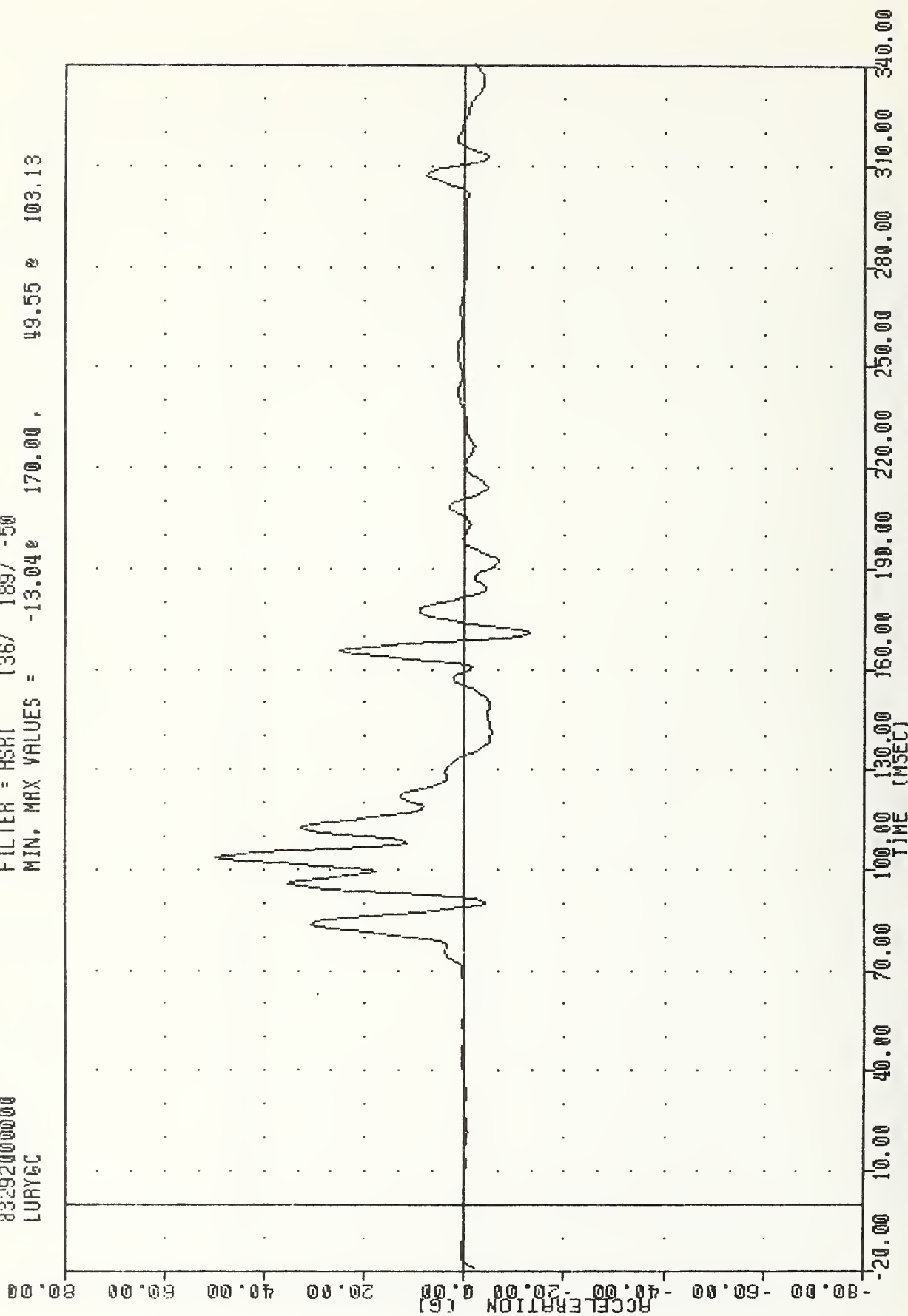
EVALUATION OF MOD YW FLEET

83292000000

LURYGC

FILTER = HSRI 136/ 189/ -50

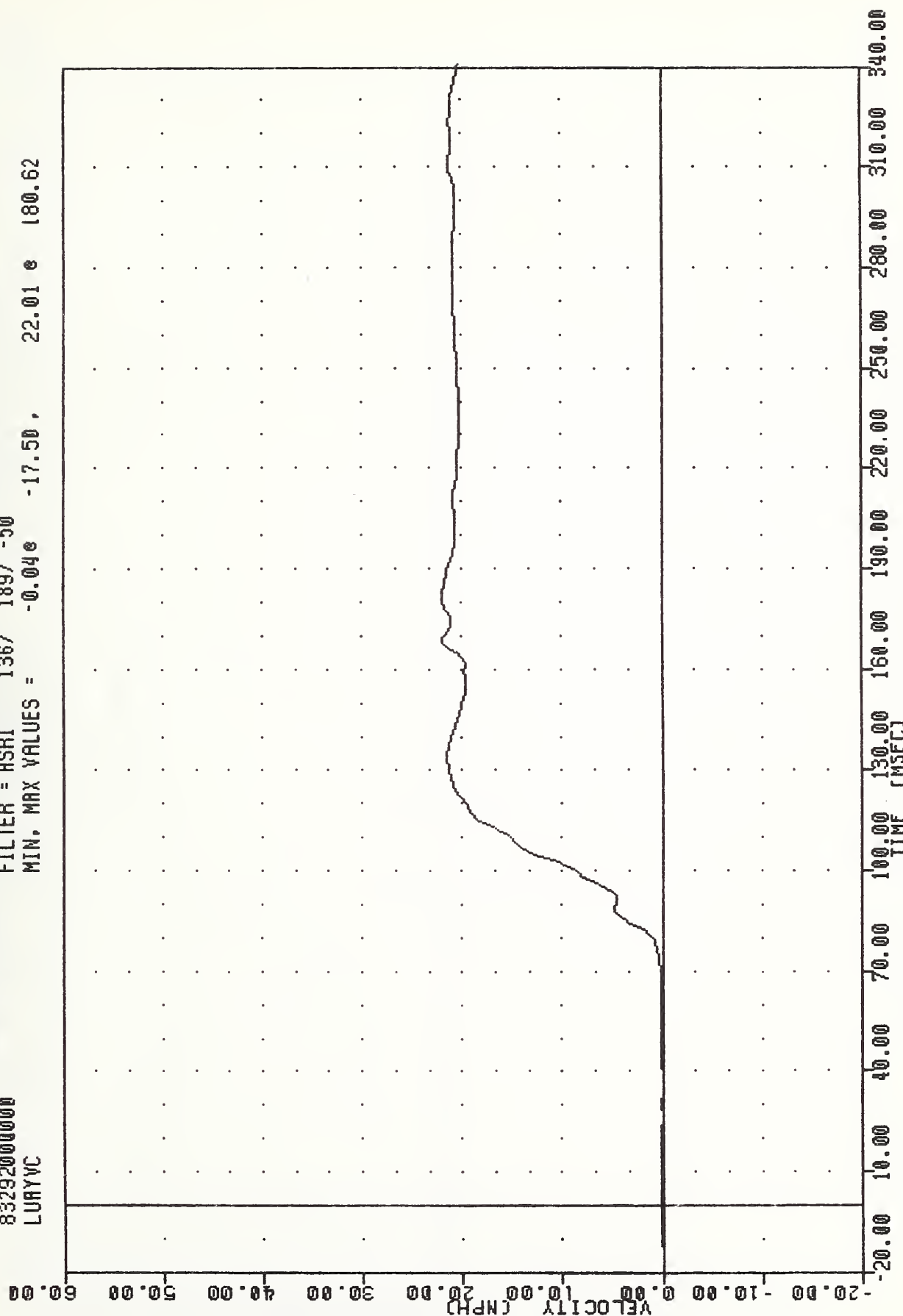
MIN. MAX VALUES = -13.04 170.00, 49.55 103.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT UPPER RIB ACCELERATION -2 Y AXIS

EVALUATION OF MOD VW FLEET
 832920000000
 LURYVC

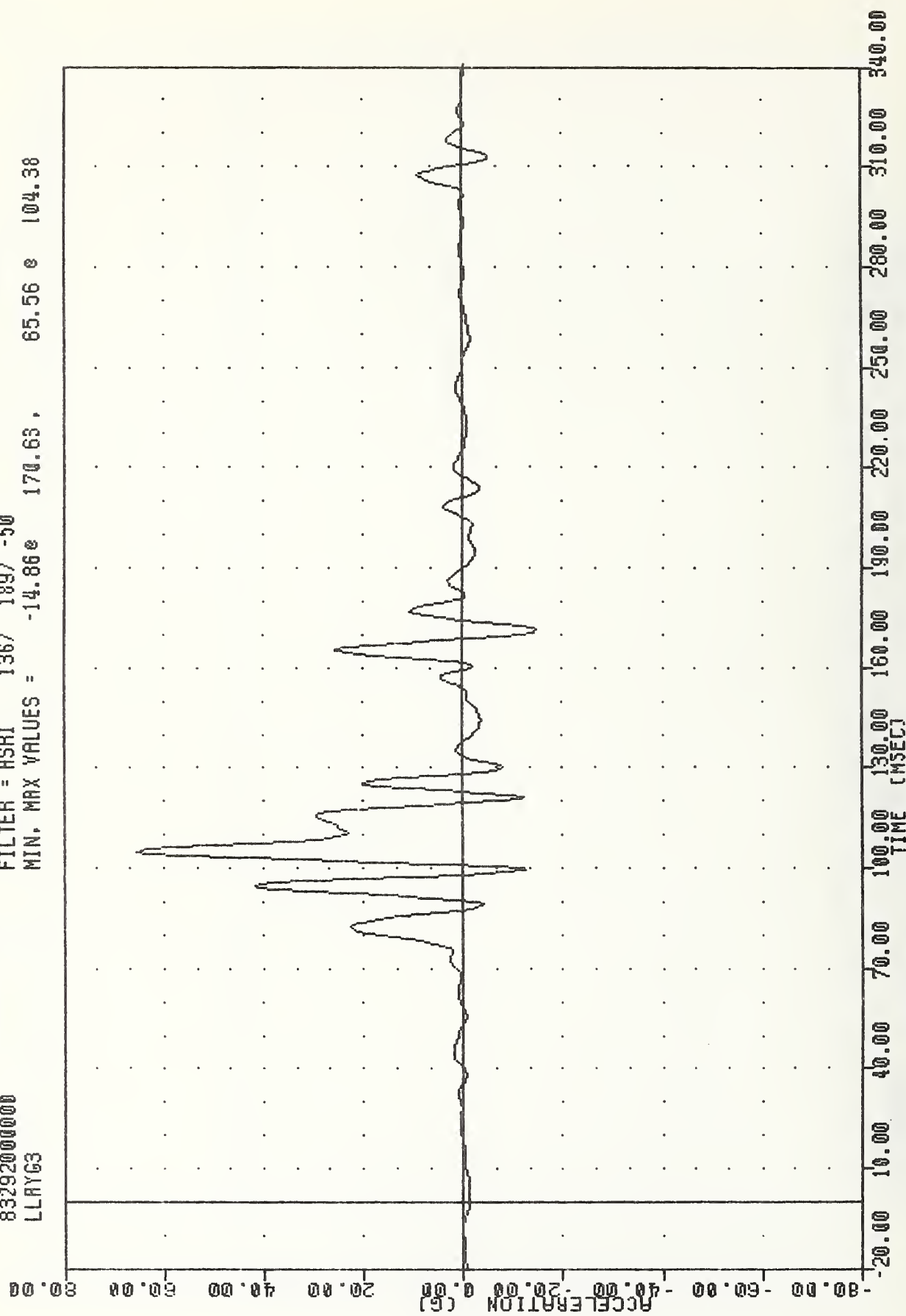
FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -0.04e -17.50, 22.01 e 180.62



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LURYVC

EVALUATION OF MOD VW FLEET
 832920000000
 LLAYG3

FILTER = HSRI 136/ 189/ -50
 MIN. MAX VALUES = -14.86e 170.63, 65.56 e 104.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER LEFT LOWER RIB ACCELERATION Y AXIS

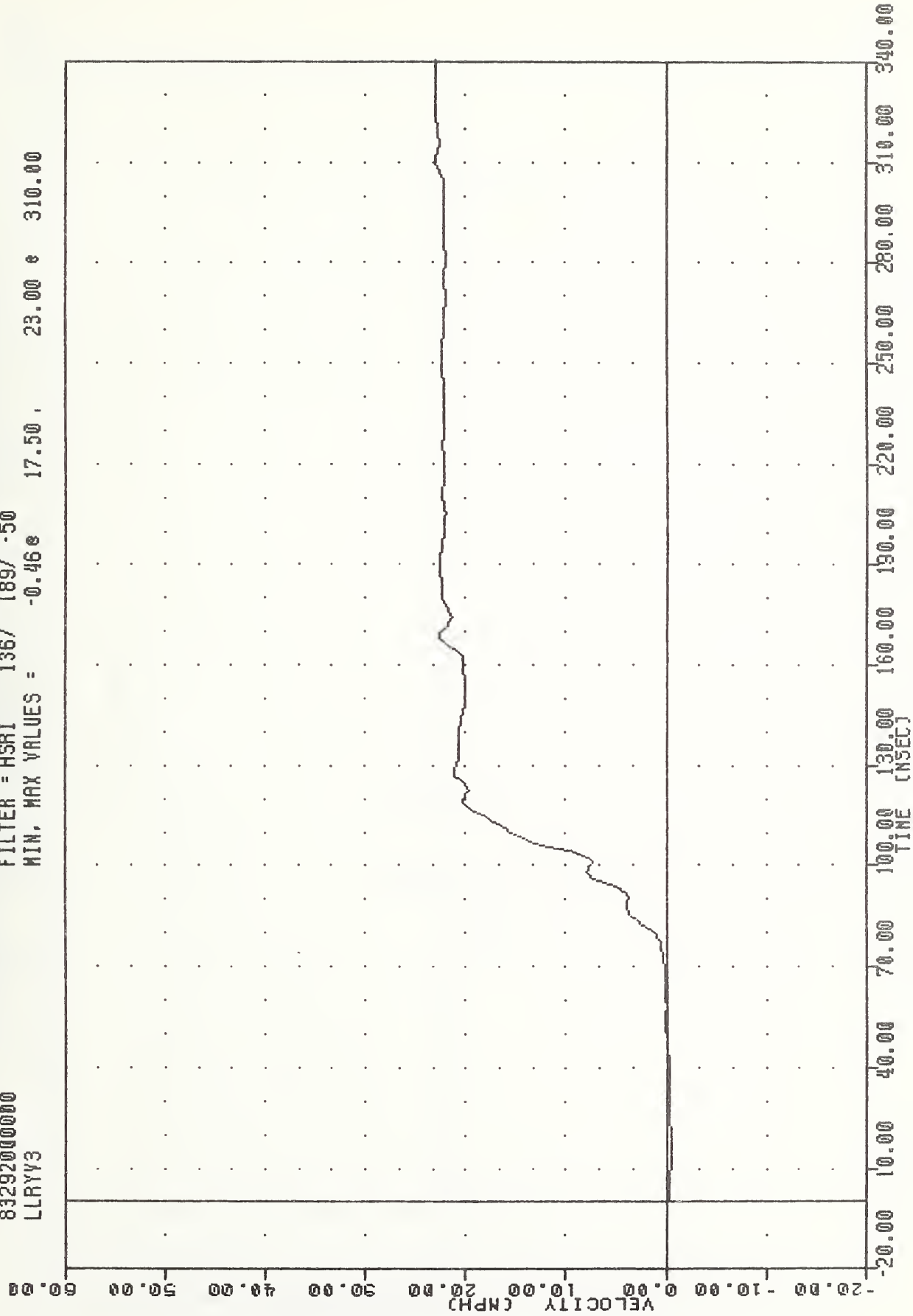
EVALUATION OF MOD VW FLEET

83292000000

LLRYV3

FILTER = HSRI 136/ 189/ -50

MIN, MAX VALUES = -0.46 17.50 23.00 310.00



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LLRYG3

EVALUATION OF MOD VN FLEET

83292000000

LLRY5C

FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -15.04e

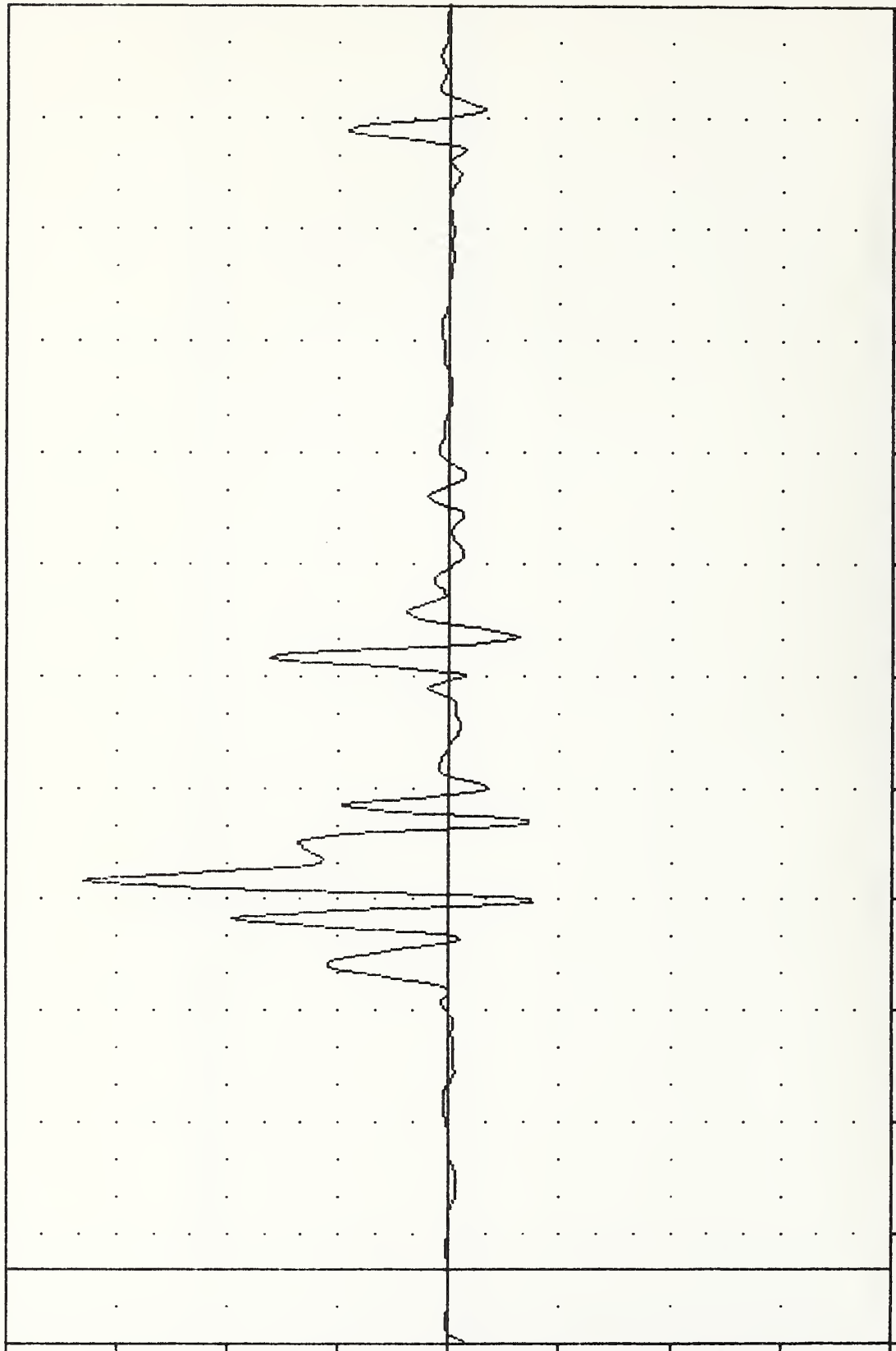
98.75 ,

65.96 e

104.38

ACCELERATION (G)

B-62



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

PASSENGER LEFT LOWER RIB ACCELERATION -2 Y AXIS

EVALUATION OF MOD YW FLEET

83292000000

LLRYVC

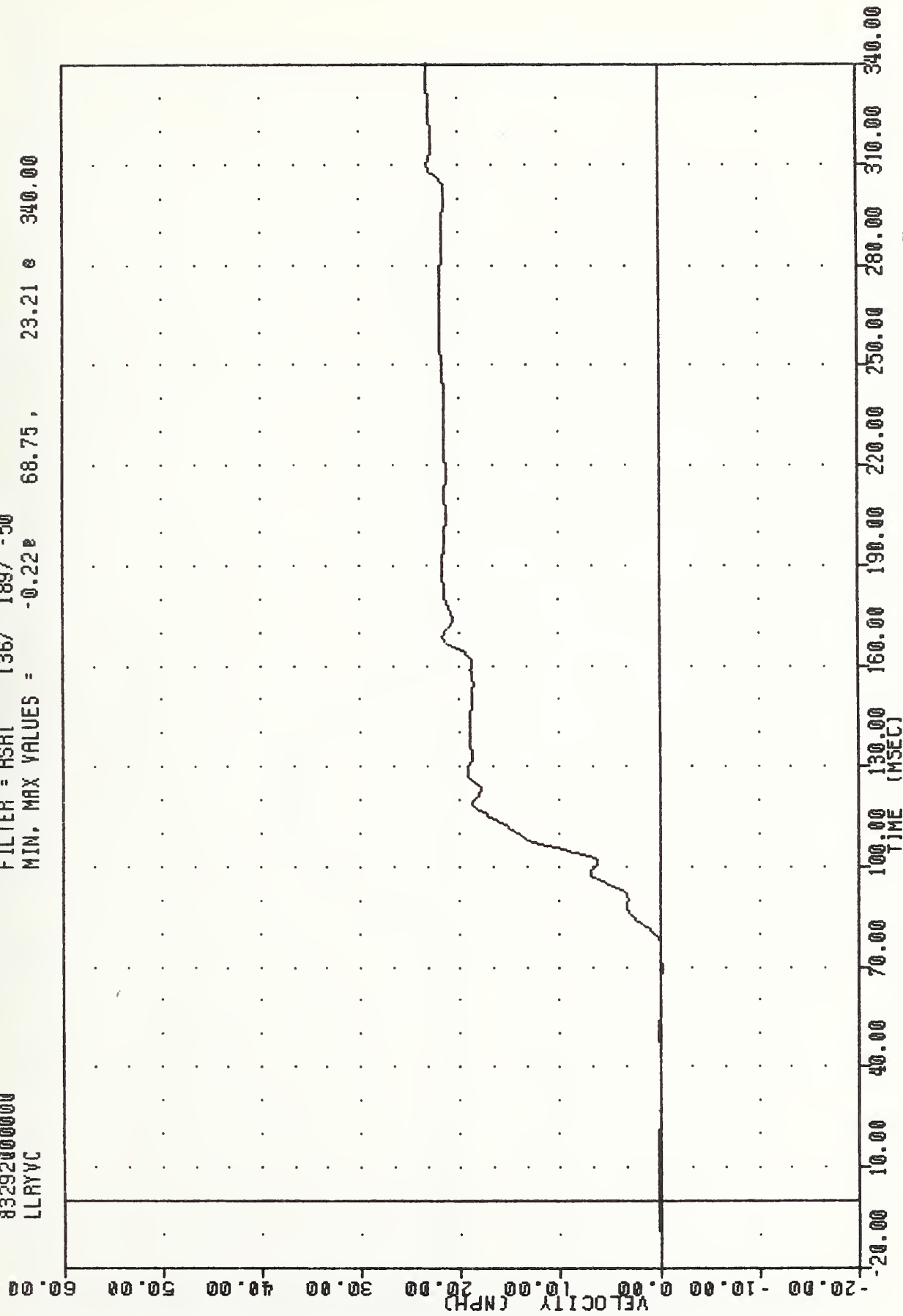
FILTER = HSRI 136/ 189/ -50

MIN. MAX VALUES = -0.220

68.75,

23.21 @

340.00



EVALUATION OF MOD VW FLEET

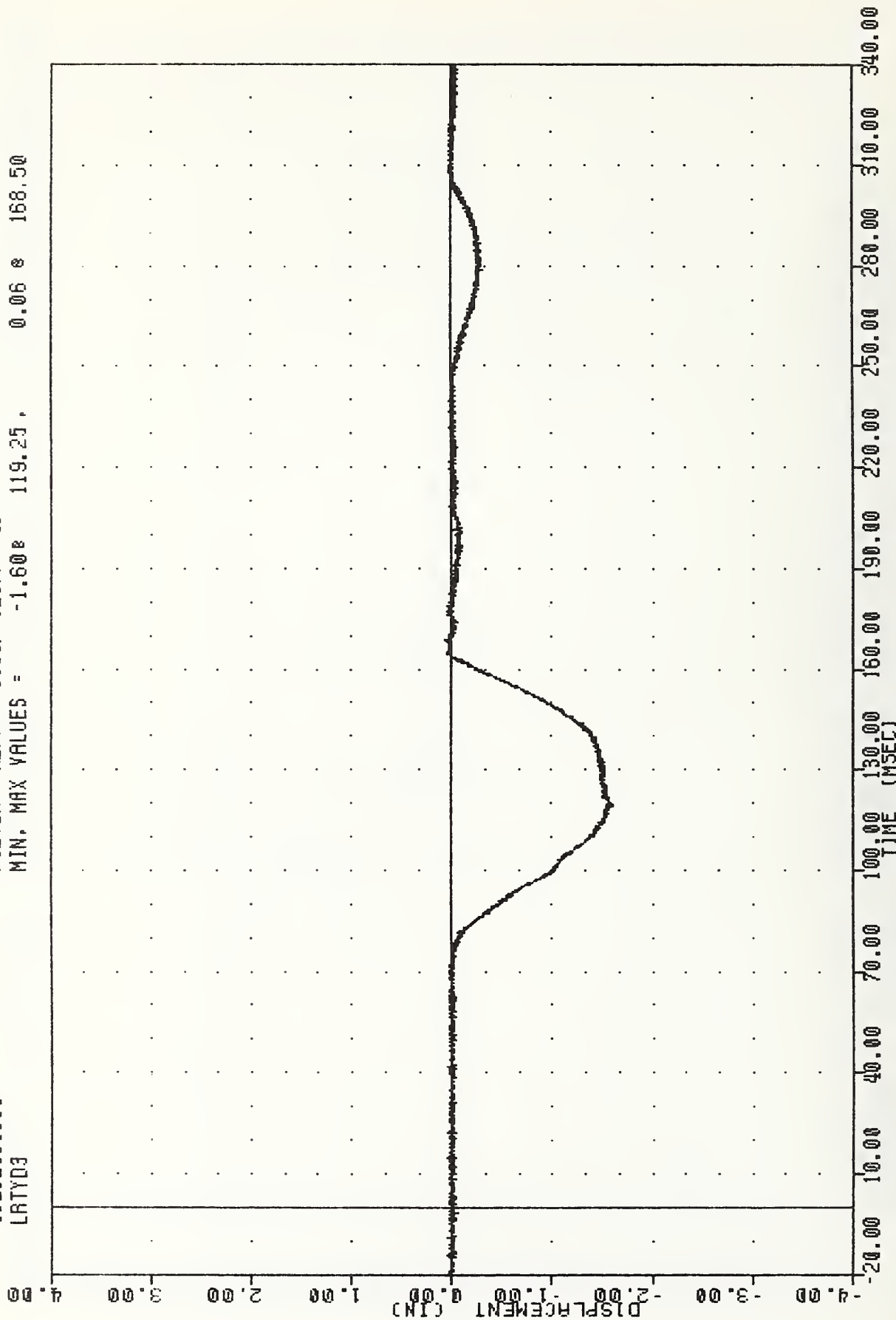
83292000000

LRTYD3

FILTER = ALPF 1650/ 5217/ -40

MIN. MAX VALUES = -1.60E 119.25 .

0.06 S 168.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
PASSENGER LEFT RIB TO SPINE DISPLACEMENT INCHES

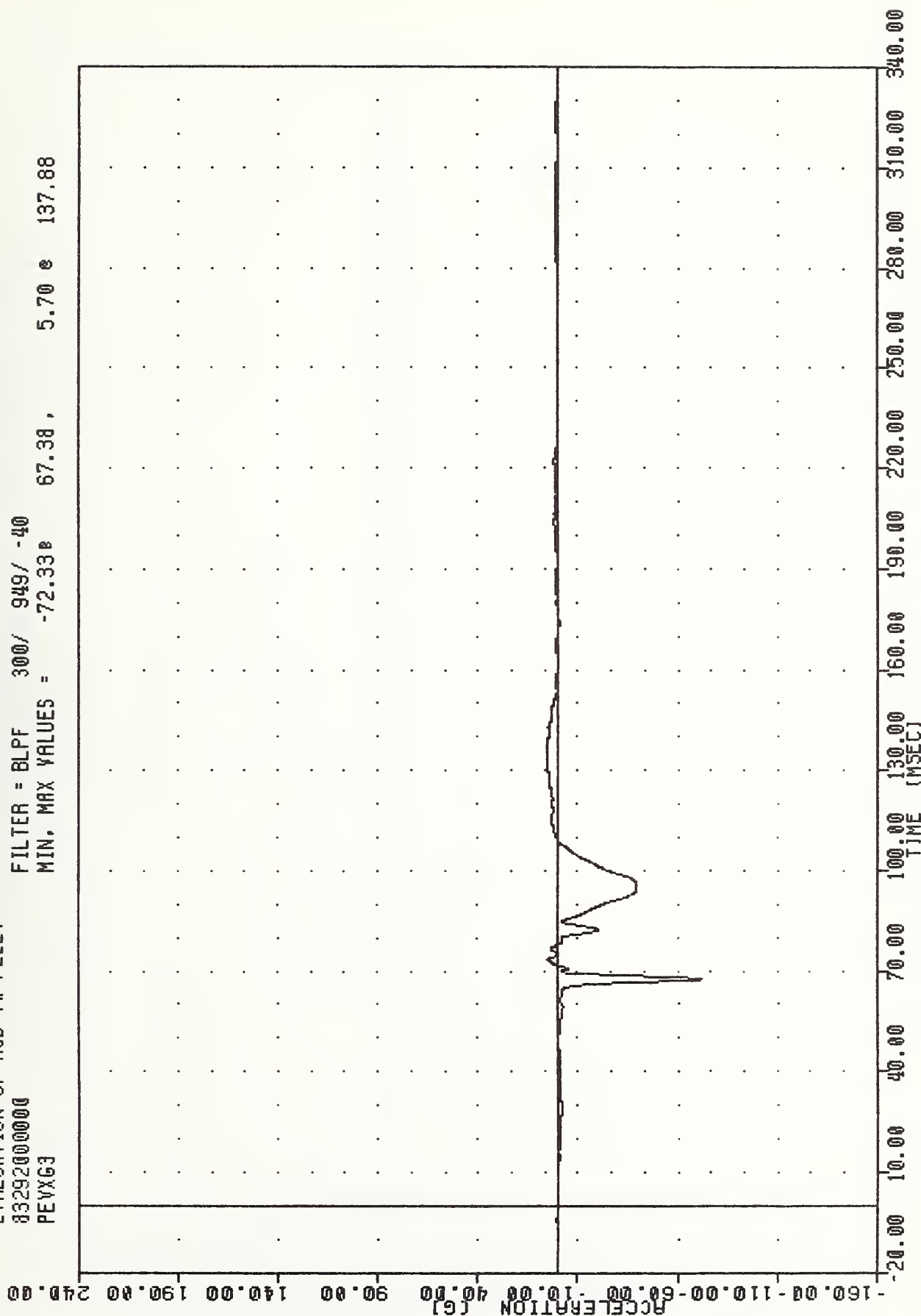
EVALUATION OF MOD YW FLEET

832920000000

PEVXG3

FILTER = BLPF 300/ 949/ -40

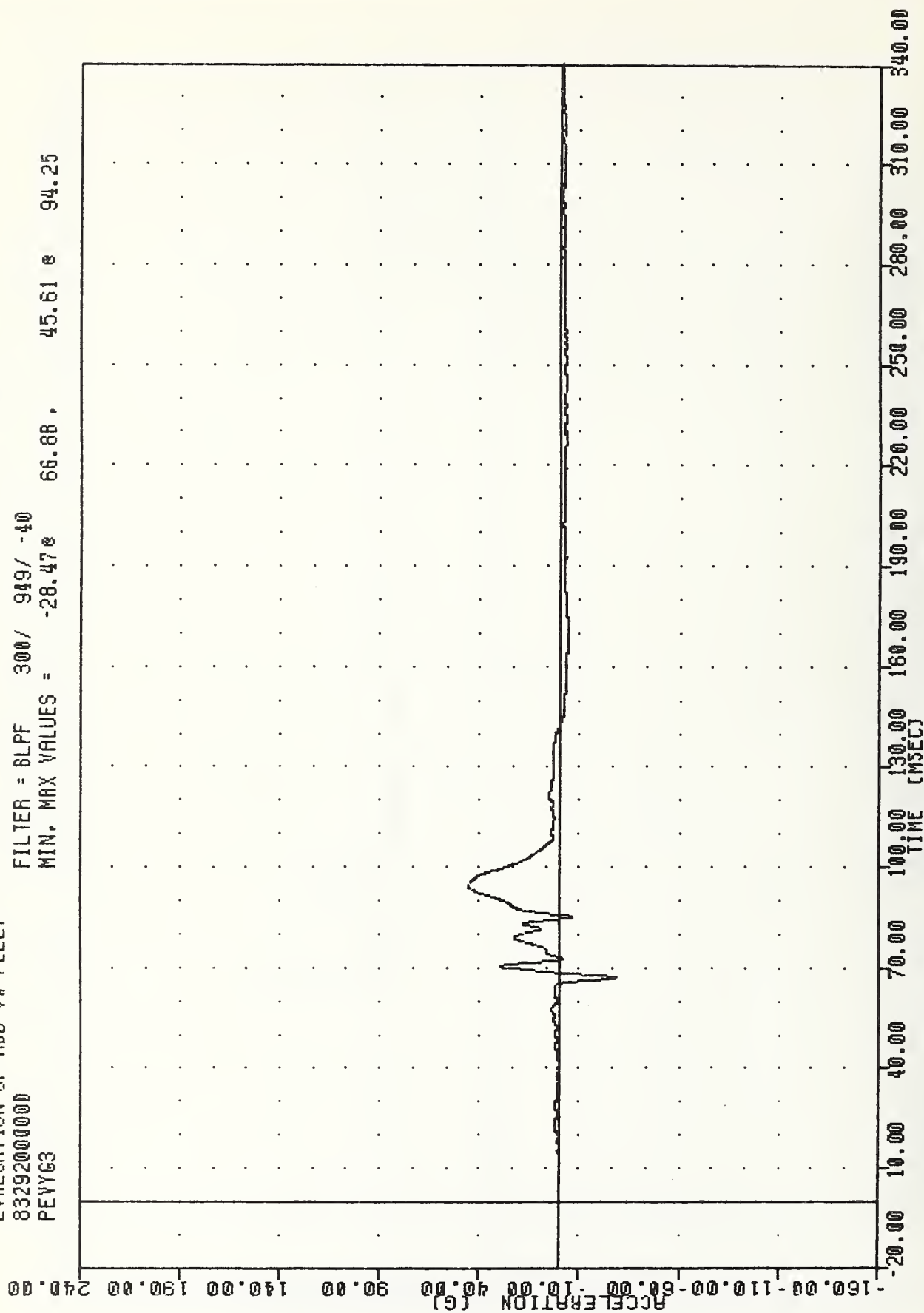
MIN, MAX VALUES = -72.33 67.38 , 5.70 137.88



EVALUATION OF MDD VW FLEET
 832920000000
 PEY63

FILTER = BLPF 300/ 949/ -40
 MIN, MAX VALUES = -28.47 66.88

45.61 94.25



EVALUATION OF MOD VW FLEET

83292000000

PEVZ63

FILTER = BLPF 300/ 949/ -40

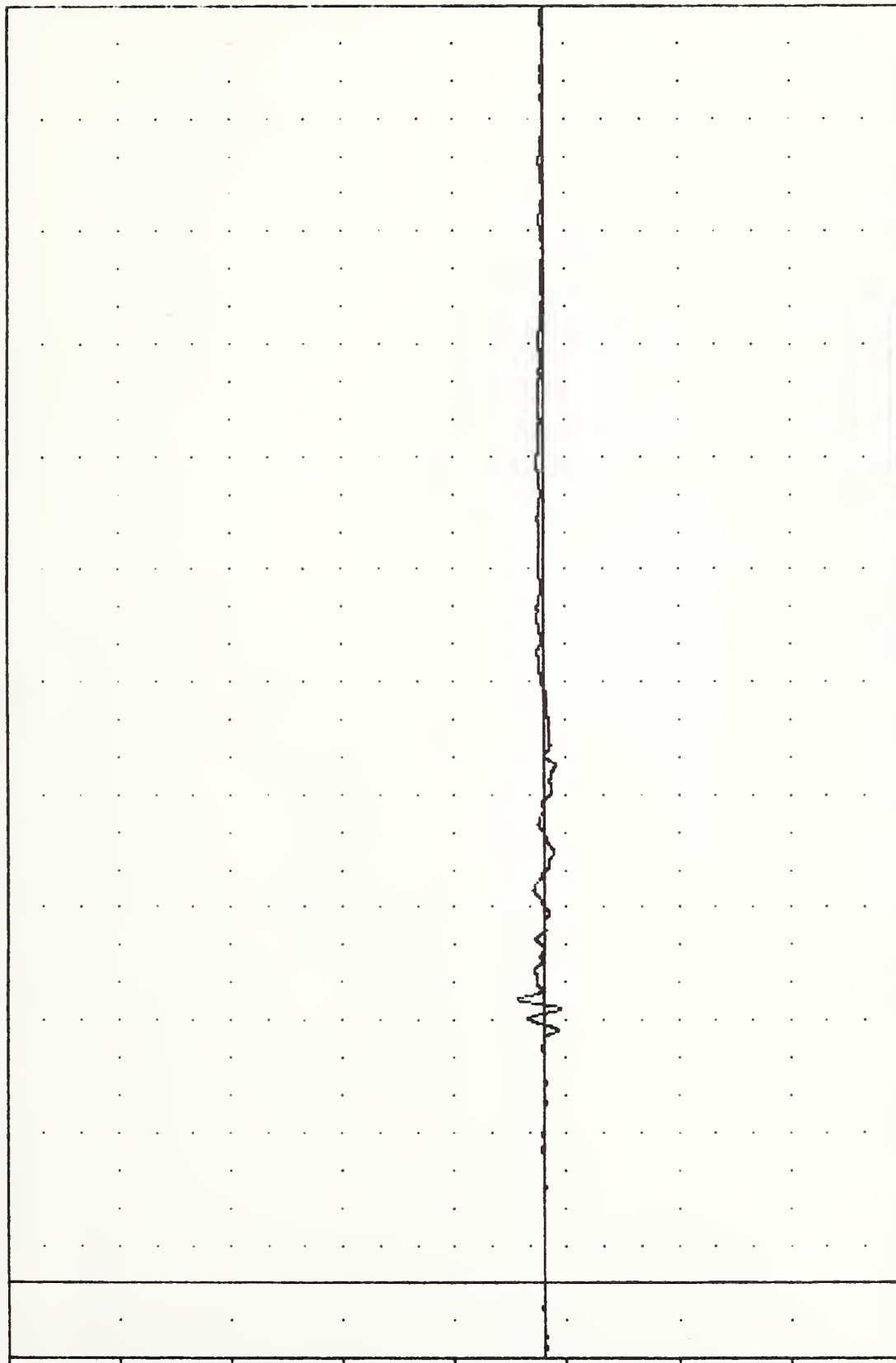
MIN. MAX VALUES = -7.95e

72.88,

11.99 e

75.38

ACCELERATION [G]

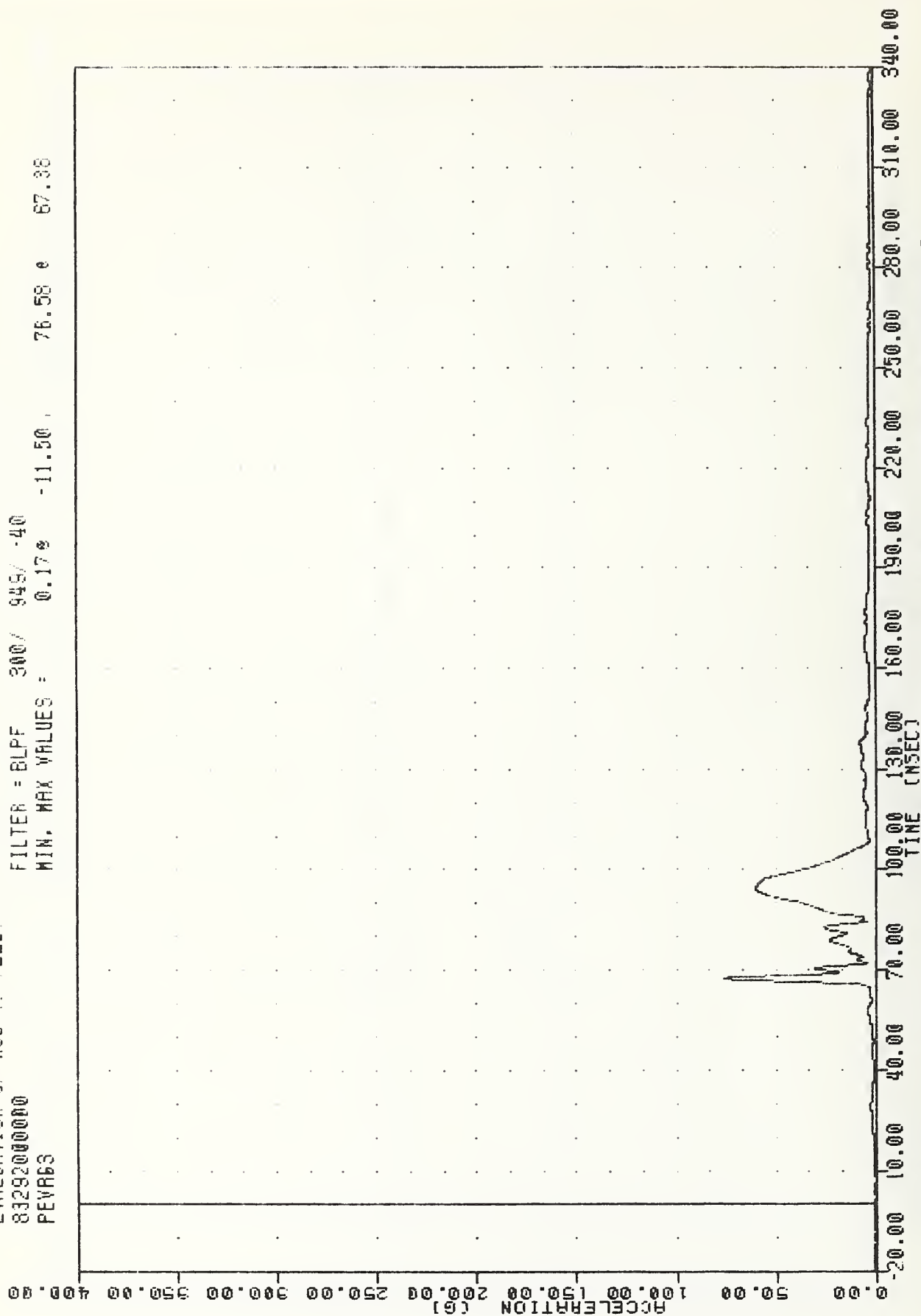


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

PASSENGER PELVIS ACCELERATION Z AXIS

EVALUATION OF MOD VN FLEET
 832920000000
 PEVR63

FILTER = BLPF 300/ 945/ -40
 MIN. MAX VALUES = 0.17% -11.50 76.58 e 67.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 PASSENGER PELVIS RESULTANT

EVALUATION OF MOD VW FLEET

83292000000

PEVYV3

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.000 -20.00 .

20.14 8 142.13

60.00

50.00

40.00

30.00

20.00

10.00

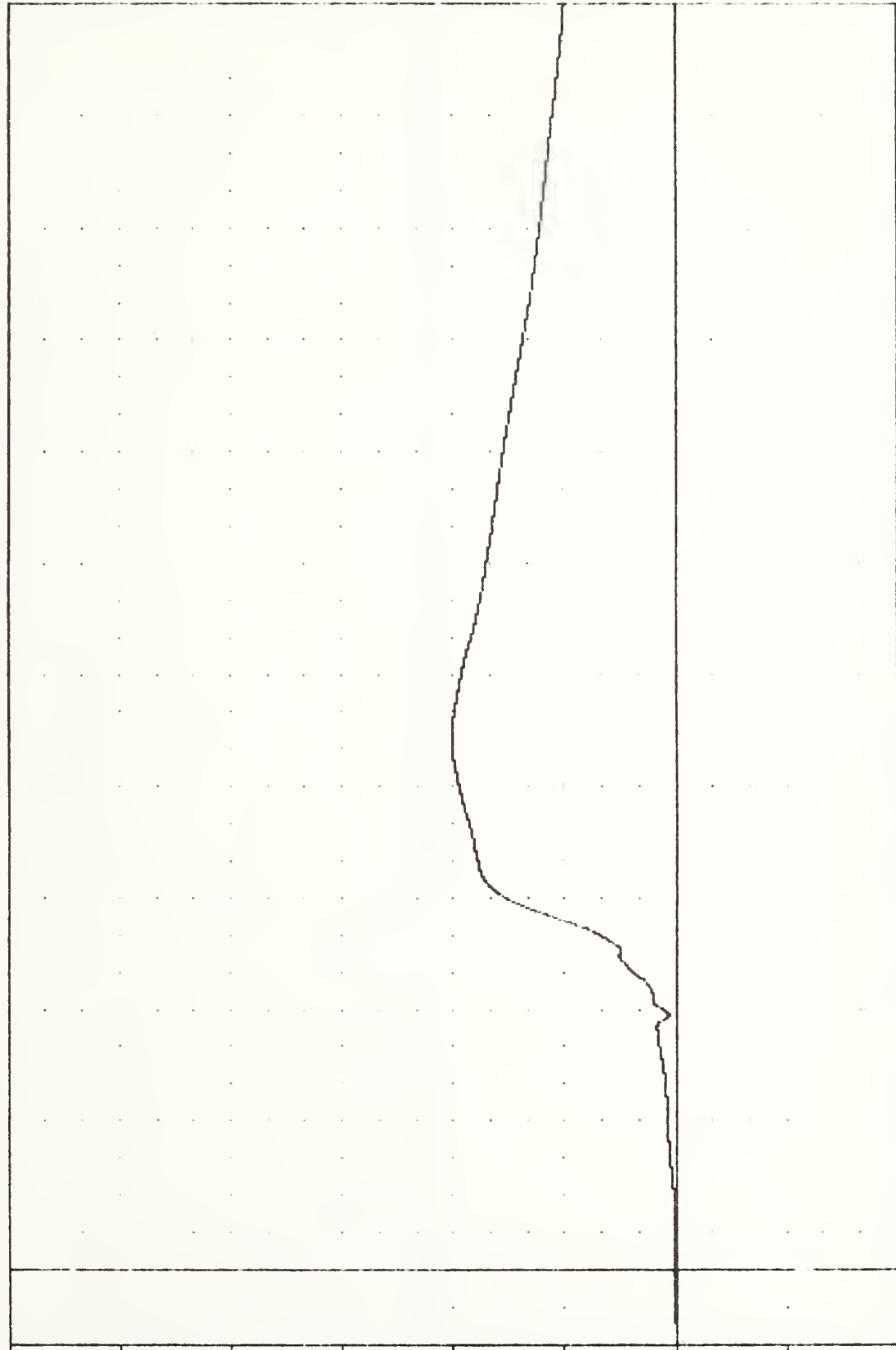
0.00

-10.00

-20.00

B-69

VELOCITY (MPH)



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING PEVY63

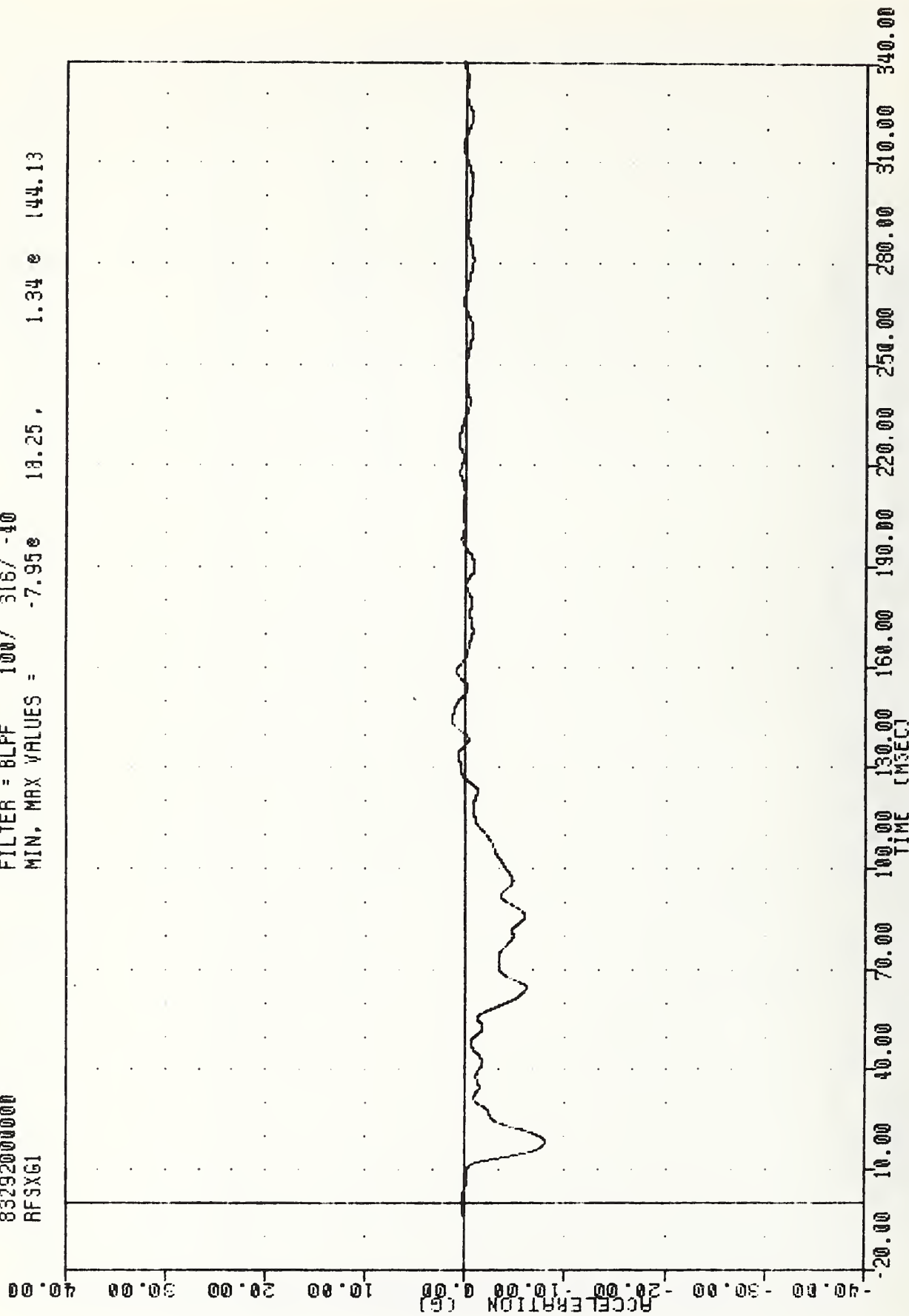
EVALUATION OF MOD VW FLEET

832920000000

RFSXG1

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -7.95e 18.25, 1.34 e 144.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL ACCELERATION X AXIS

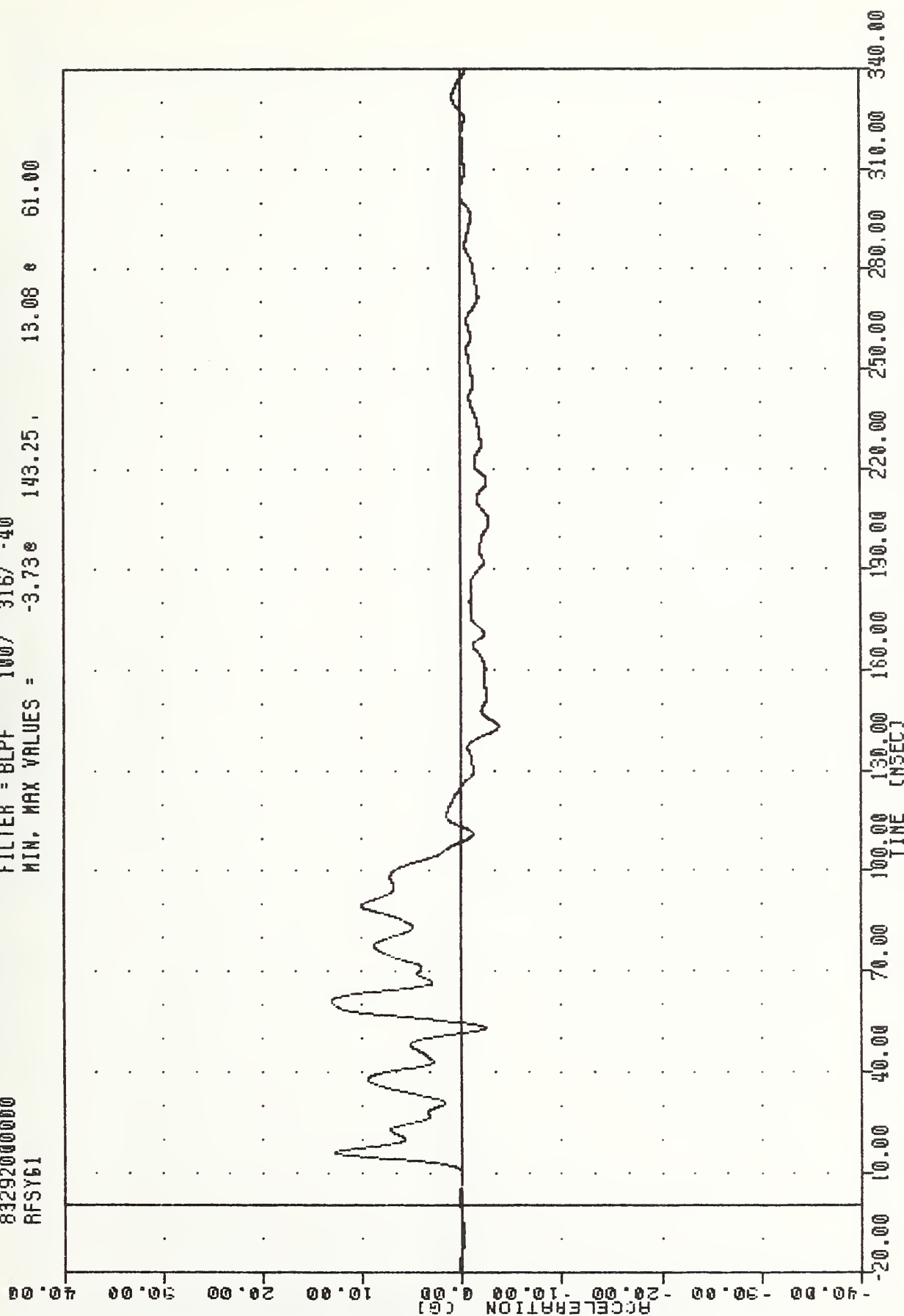
EVALUATION OF MOD VW FLEET

83292000000

RFSY61

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -3.73e 143.25, 13.08 e 61.00



EVALUATION OF MOD YW FLEET

83292000000

AFS2G1

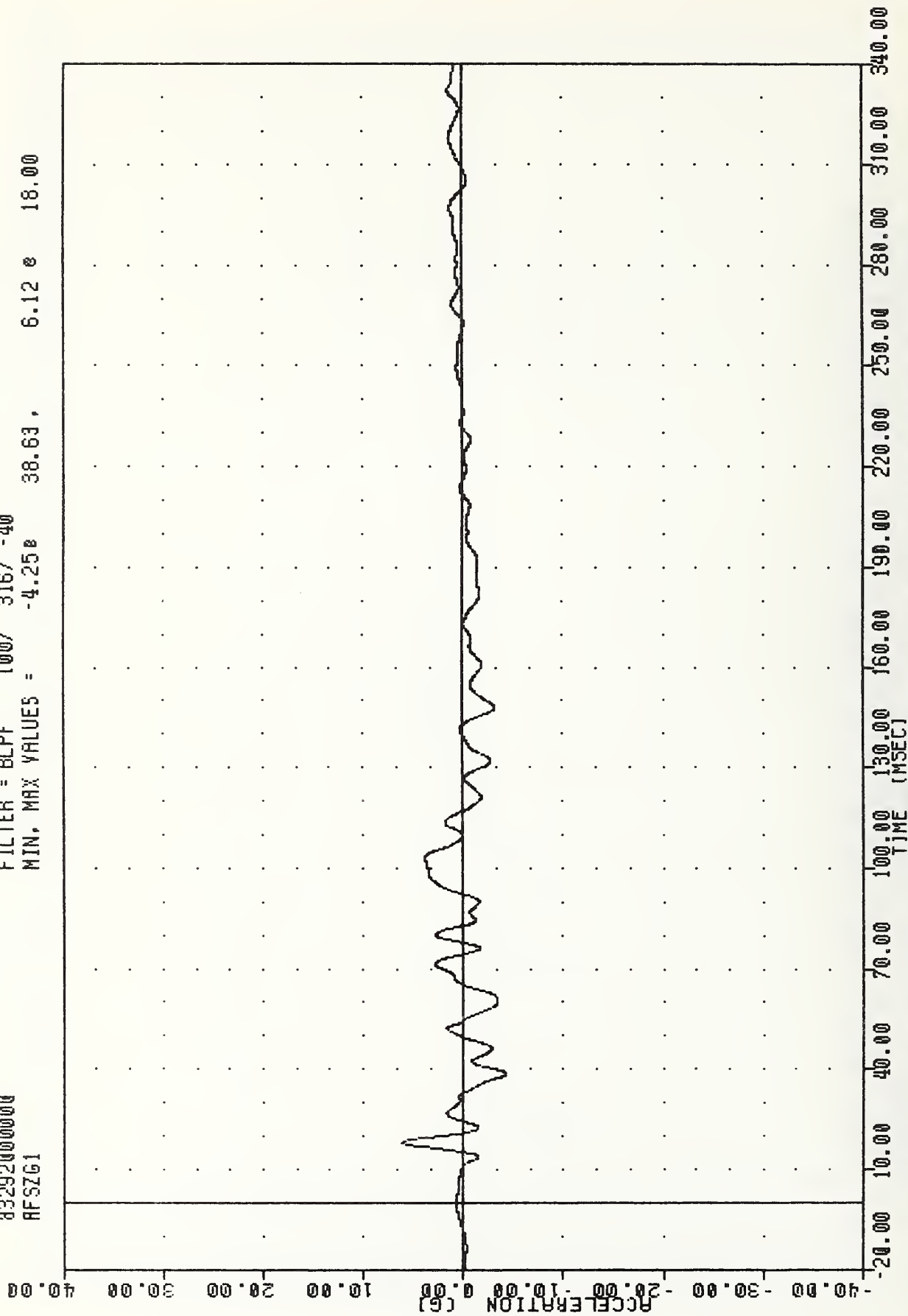
FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -4.25g

38.63,

6.12 g

18.00



EVALUATION OF MOD YW FLEET

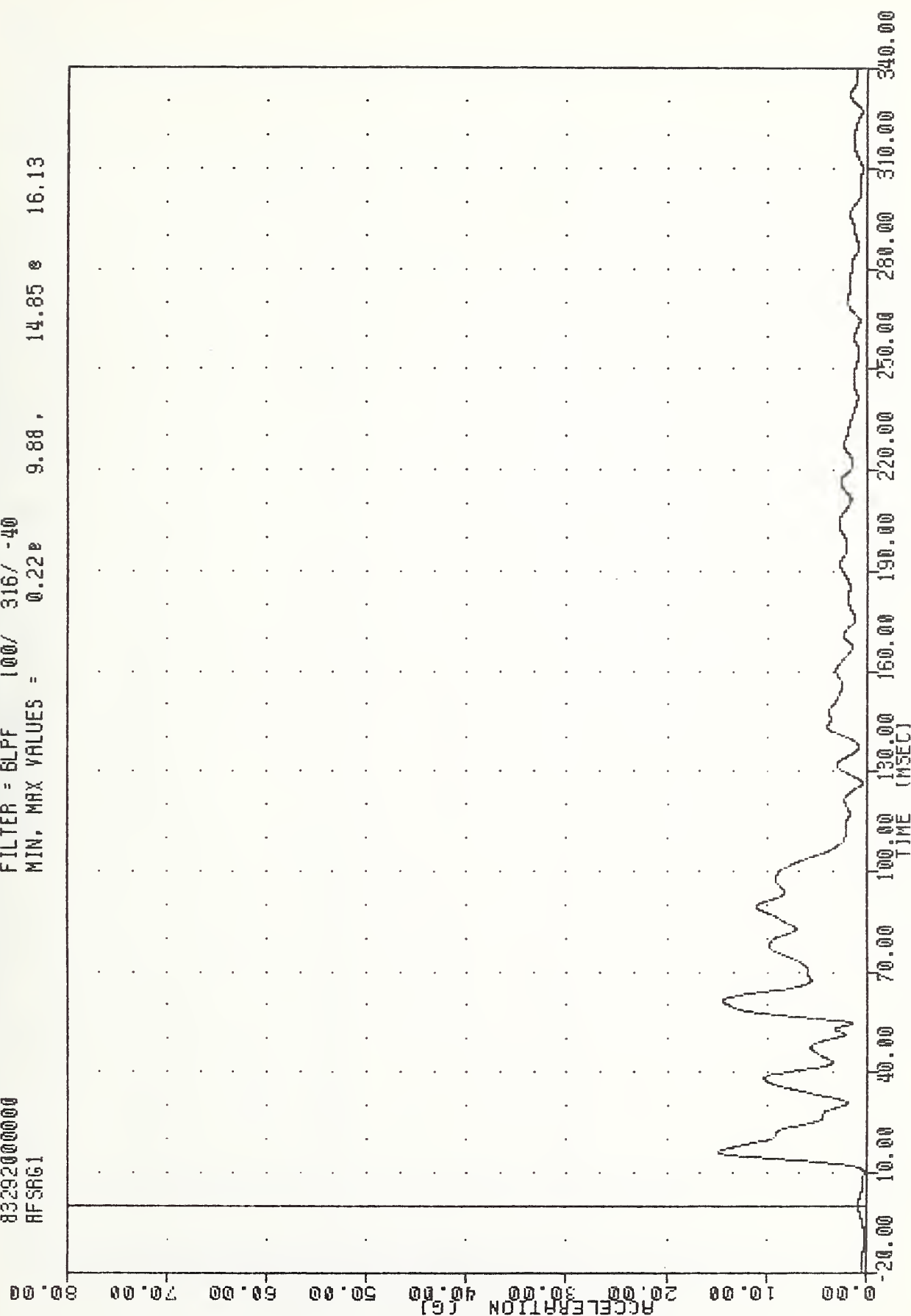
83292000000

RFSRG1

FILTER = 6LPF 100/ 316/ -40

MIN. MAX VALUES = 0.22e

9.88, 14.85 e 16.13



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT FRONT SILL RESULTANT

EVALUATION OF MDD VW FLEET

83292000000

RFSXV1

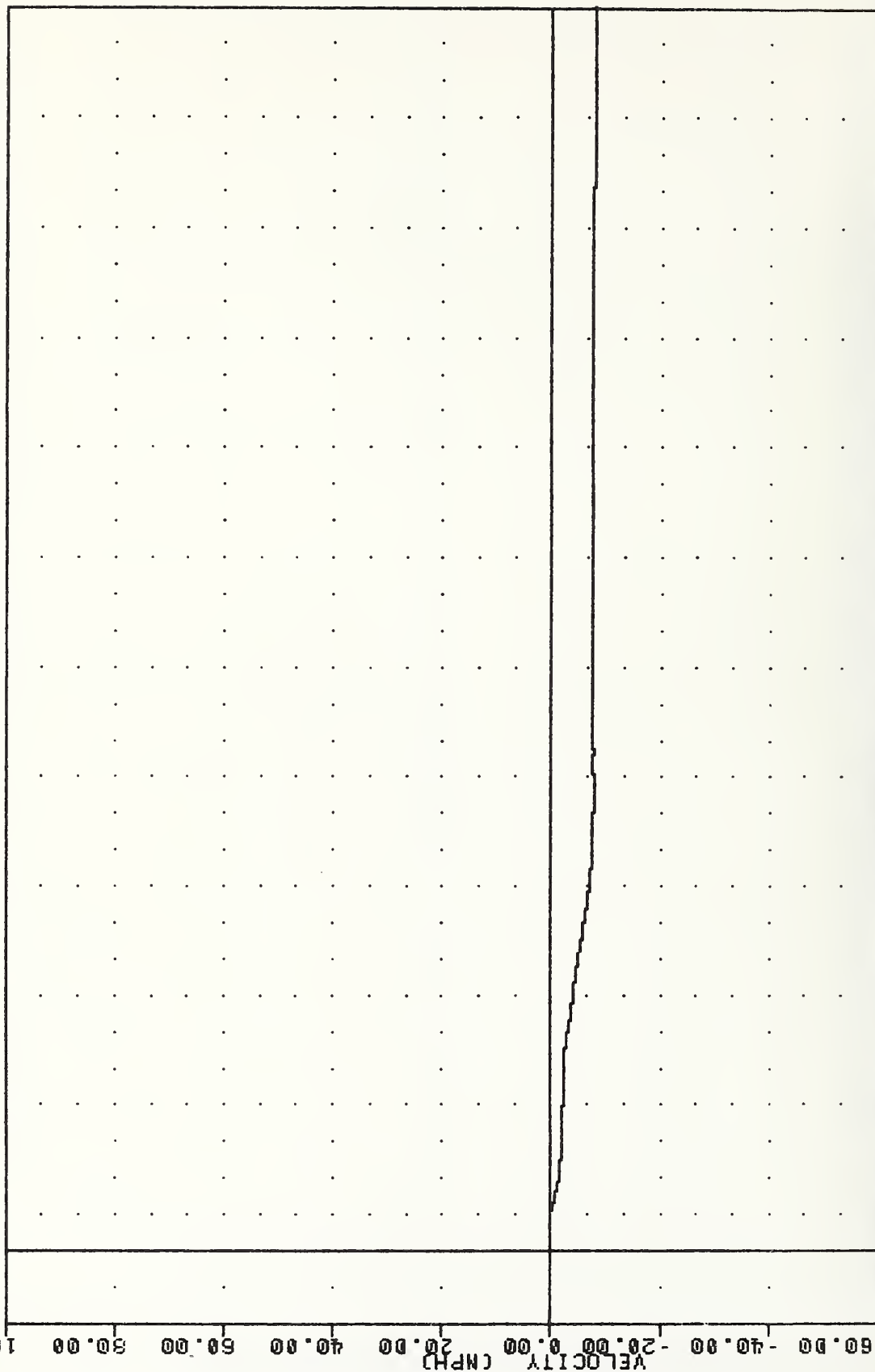
FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -7.92e 334.13 ,

0.05 e 2.25

100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
-60.00

B-74



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING RFSX61

EVALUATION OF MOD VN FLEET

83292000000

RFSYV1

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -0.02e

-7.63 ,

12.74 e

121.88

100.00

80.00

60.00

40.00

20.00

0.00

-20.00

-40.00

-60.00

-80.00

-100.00

-120.00

-140.00

-160.00

-180.00

-200.00

-220.00

-240.00

-260.00

-280.00

-300.00

B-75

VELOCITY (MPH)

-20.00

0.00

20.00

40.00

60.00

80.00

100.00

120.00

140.00

160.00

180.00

200.00

220.00

240.00

260.00

280.00

300.00

320.00

340.00

TIME (NSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING RFSYGI

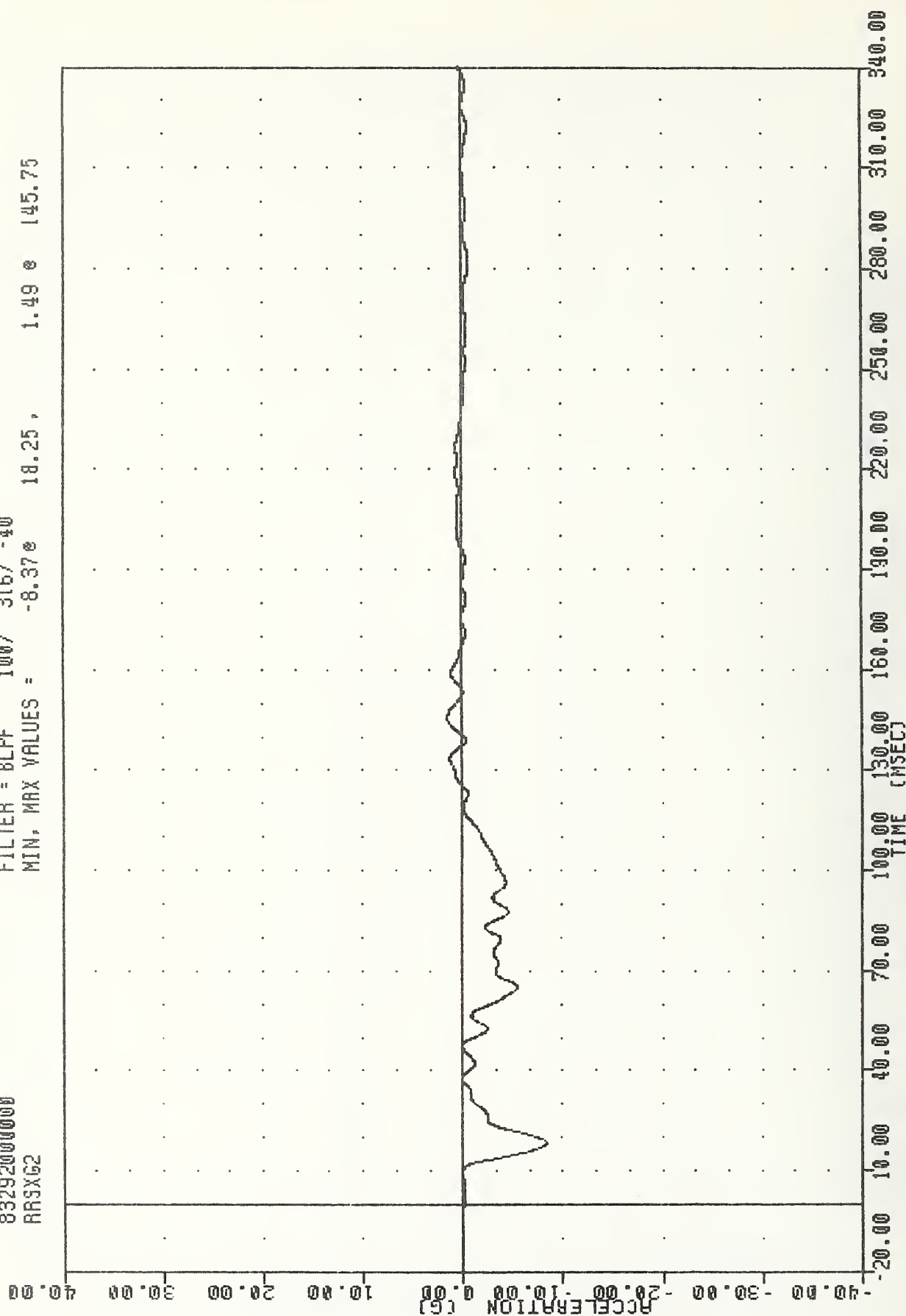
EVALUATION OF MOD VV FLEET

83292000000

RRSXG2

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -8.37 18.25, 1.49 145.75



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION X AXIS

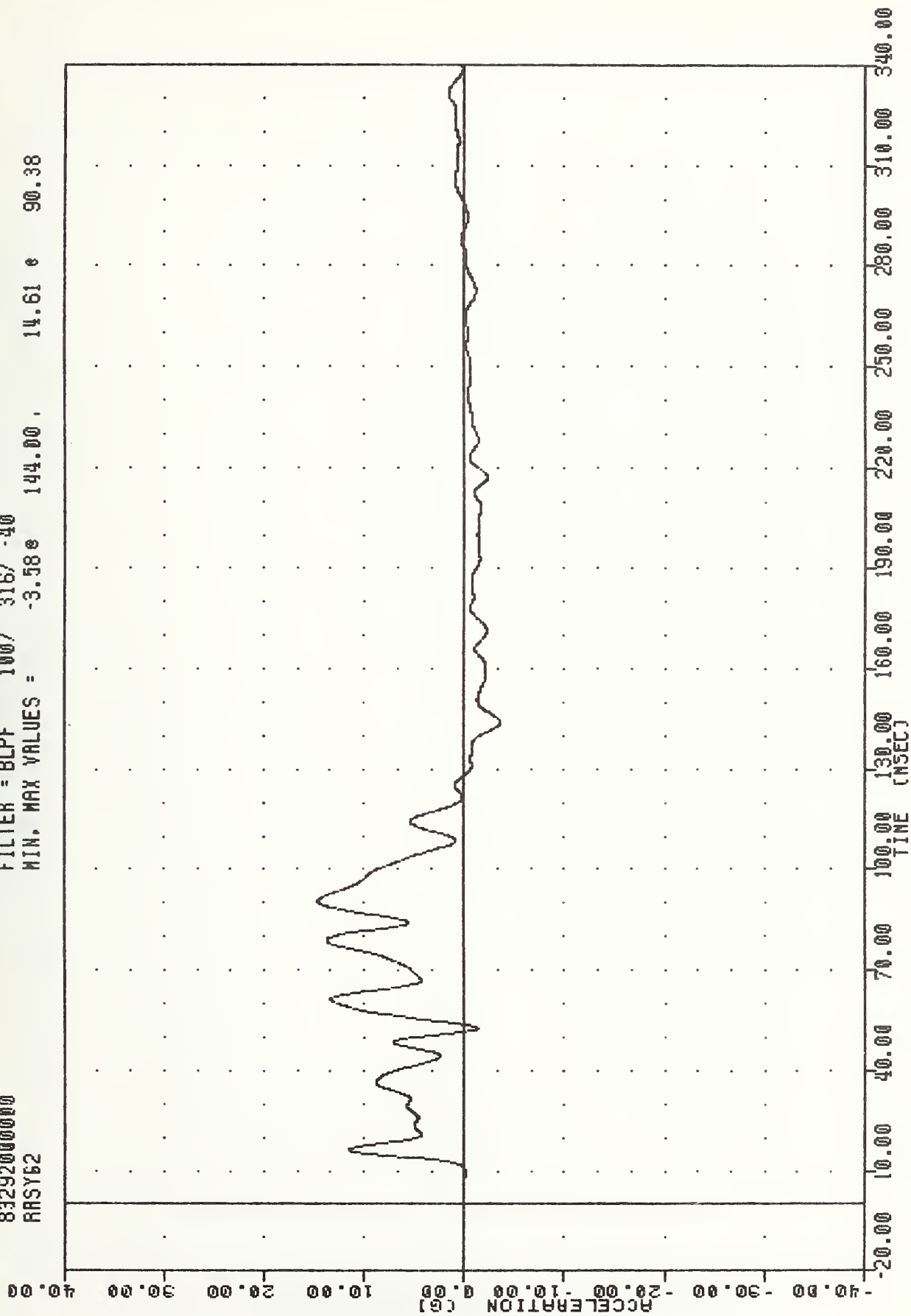
EVALUATION OF MOD VN FLEET

83292000000

RRSY62

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -3.58e 144.00 , 14.61 e 90.38



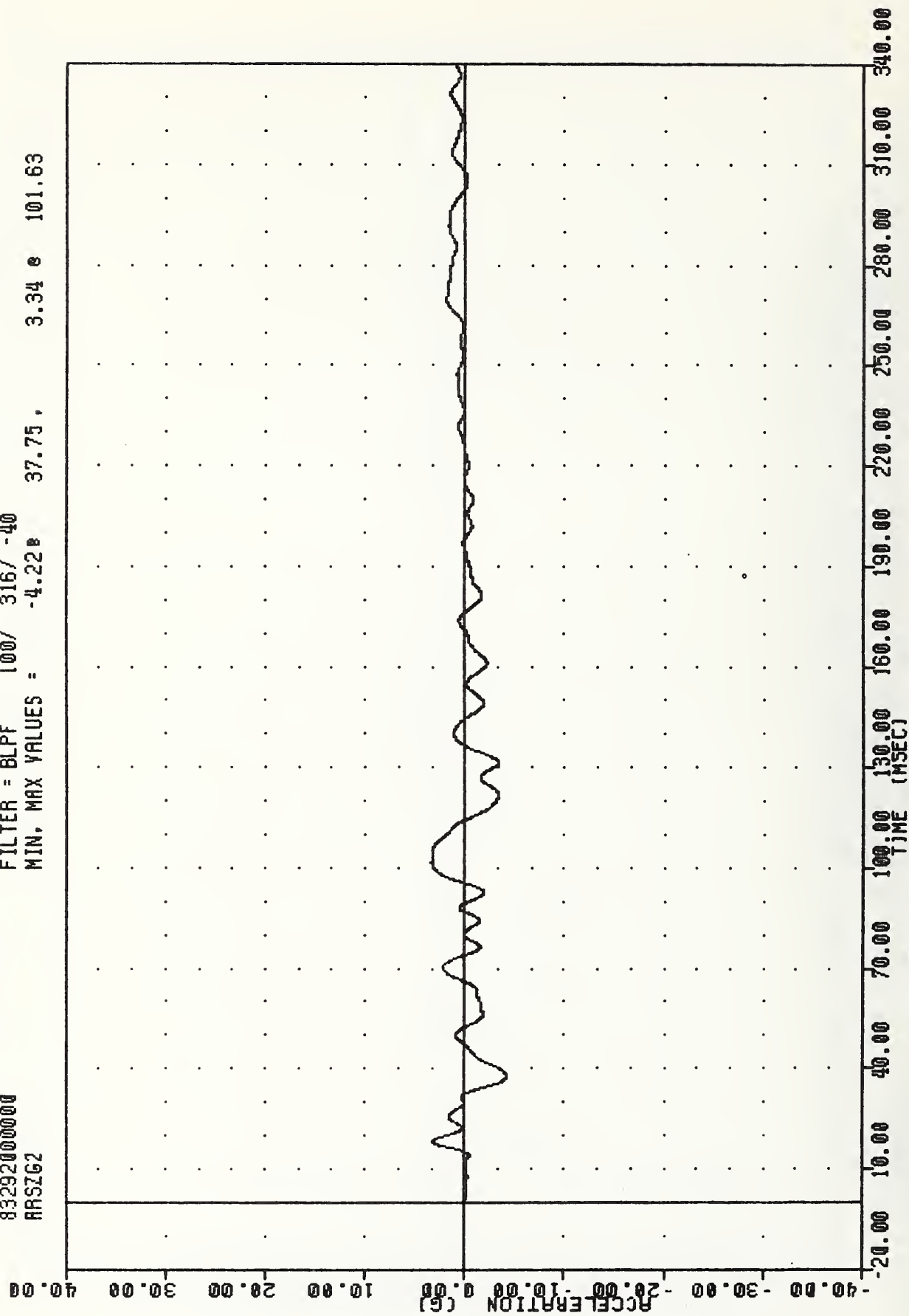
EVALUATION OF MOD YW FLEET

832920000000

ARSIG2

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -4.22 37.75, 3.34 101.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE RIGHT REAR SILL ACCELERATION Z AXIS

EVALUATION OF MOD VW FLEET

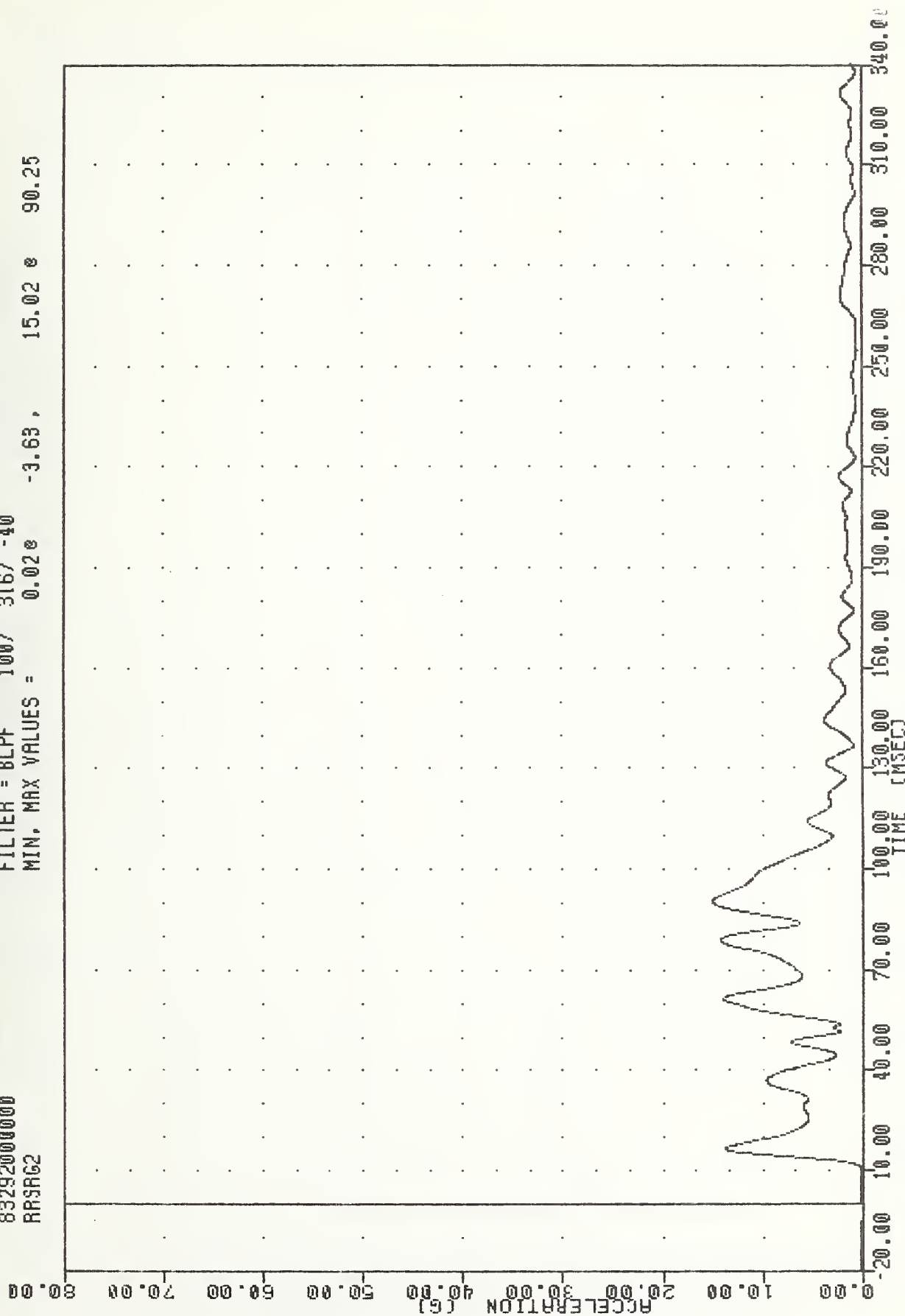
83292000000

RR3RG2

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = 0.02 e

-3.63, 15.02 e 90.25



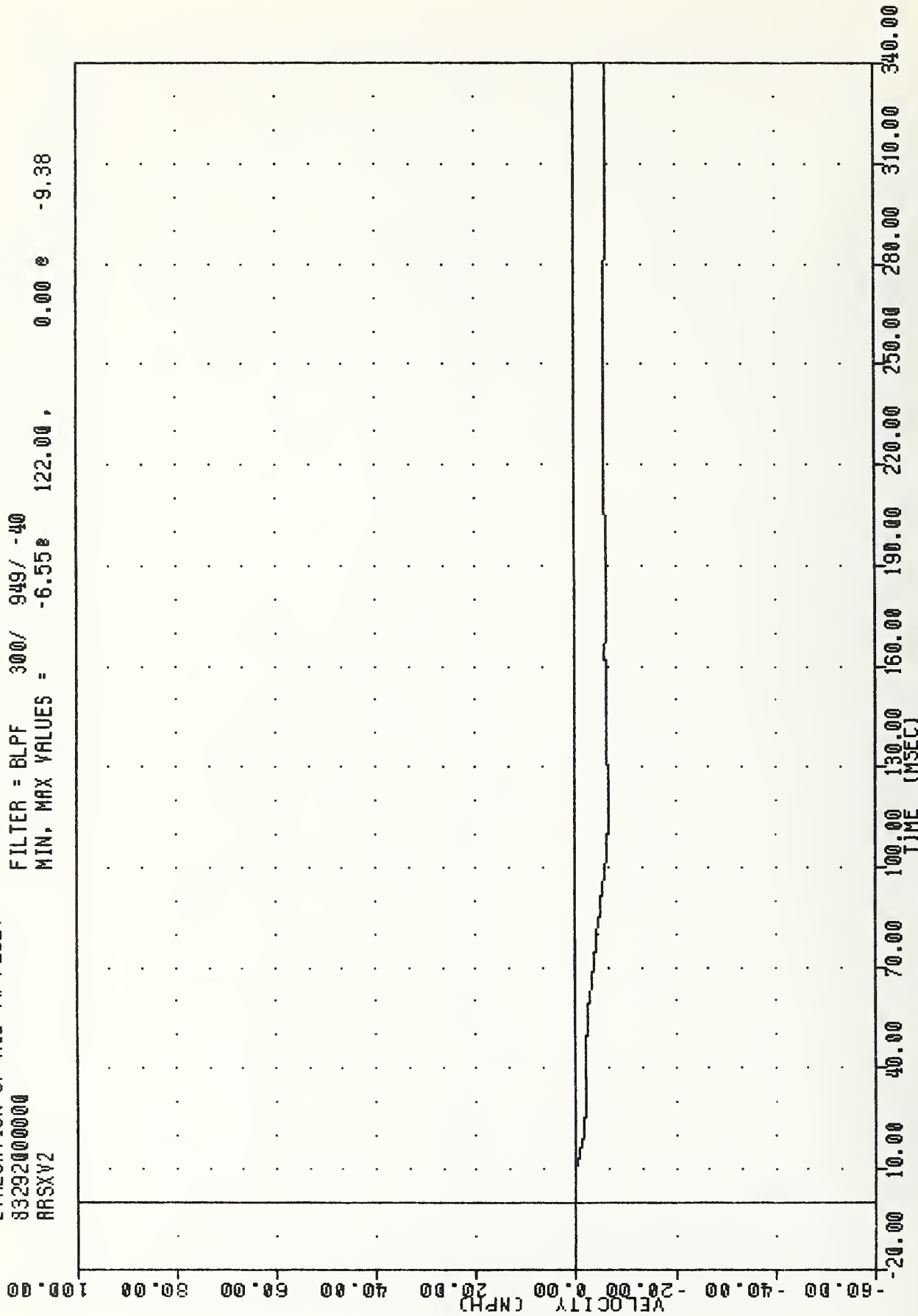
EVALUATION OF MOD YW FLEET

83292000000

RRSXV2

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -6.55e 0.00 e -9.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING ARSXG2

EVALUATION OF MDD VW FLEET

83292000000

RRSYV2

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.00e

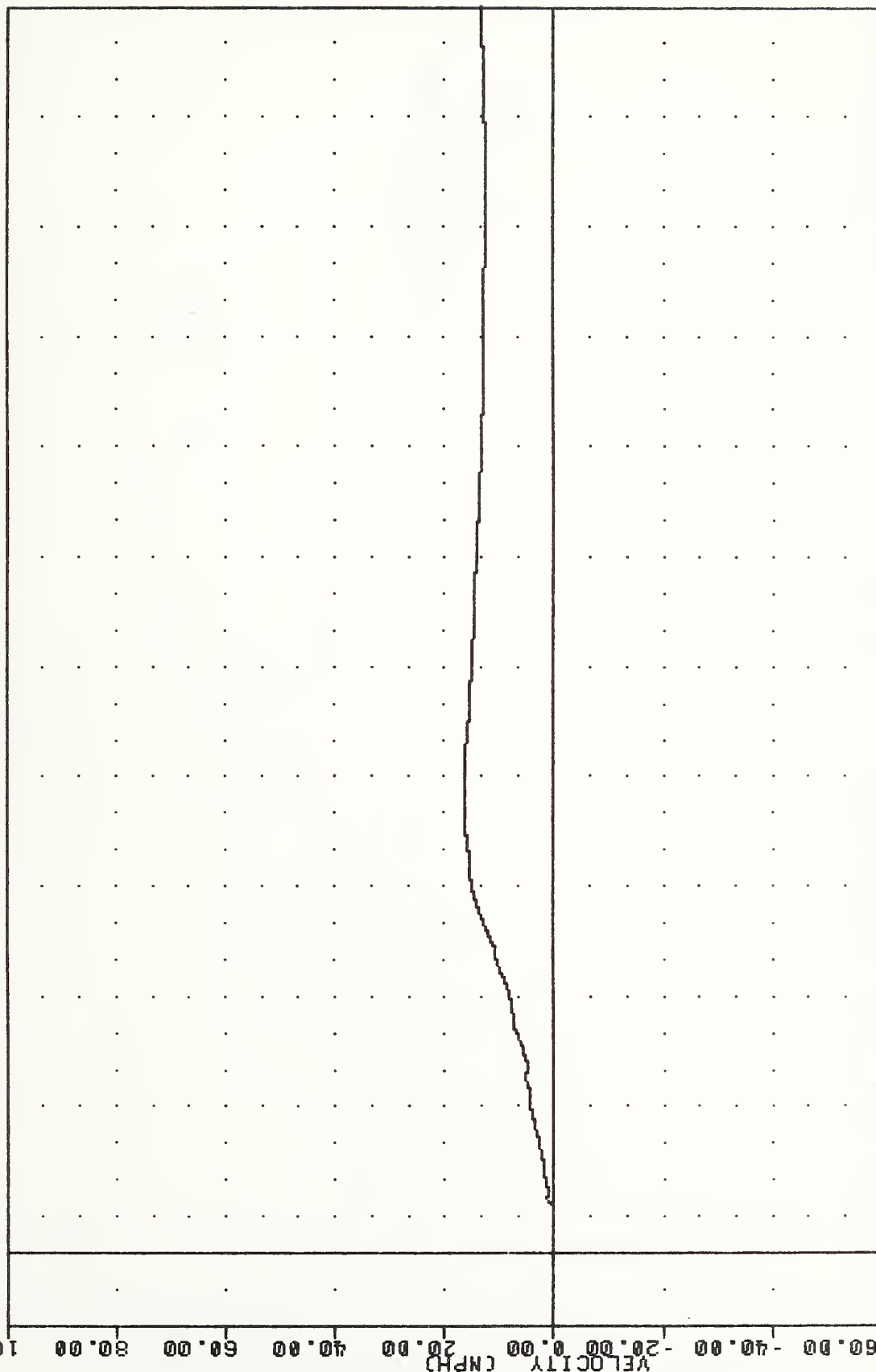
9.38,

16.34 e

123.50

100.00
80.00
60.00
40.00
20.00
0.00
-20.00
-40.00
-60.00

B-81



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RRSYG2

EVALUATION OF MOD VW FLEET

832920000000

RDKXG3

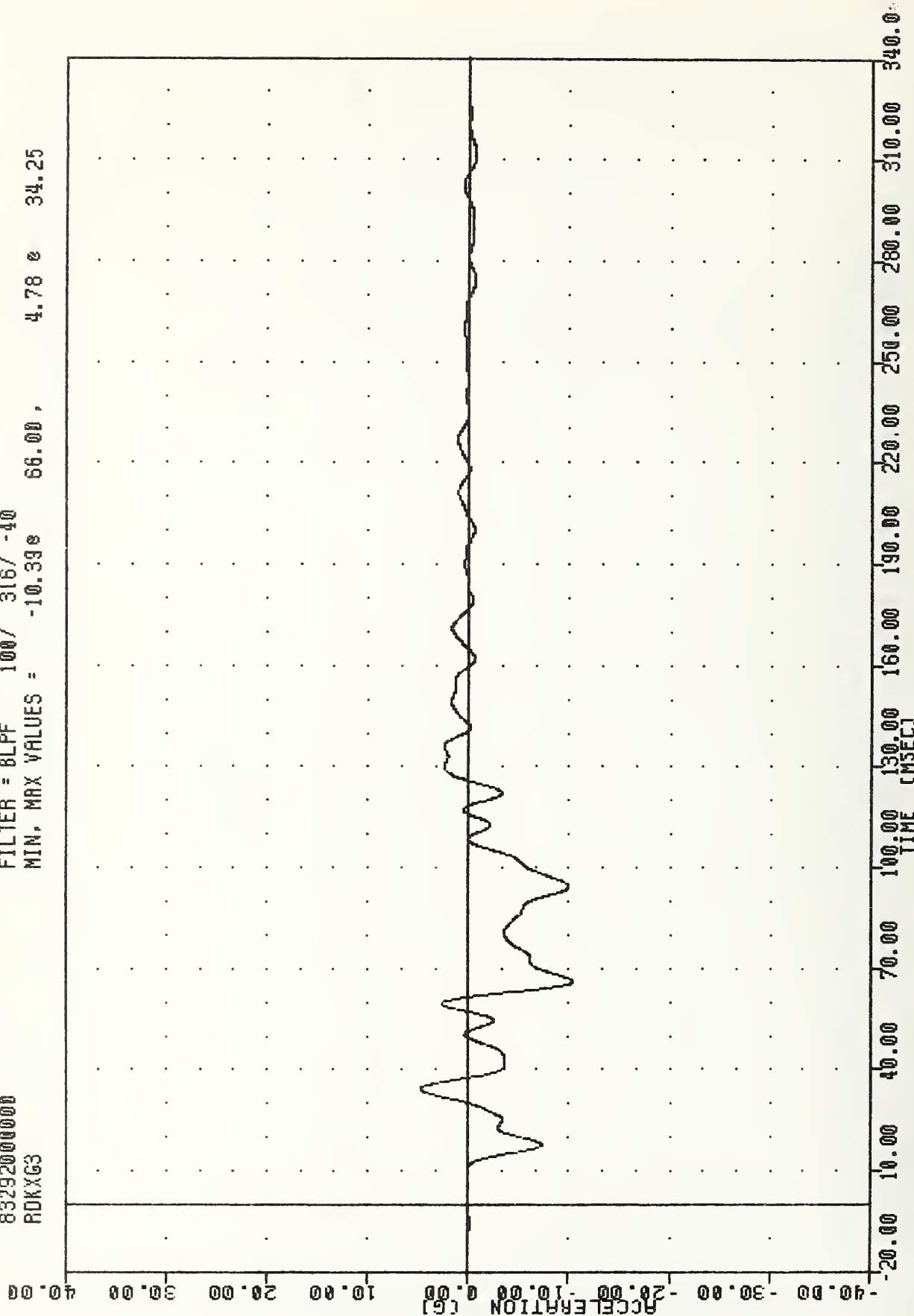
FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -10.39g

66.00,

4.78 g

34.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION X AXIS

EVALUATION OF MOD VW FLEET

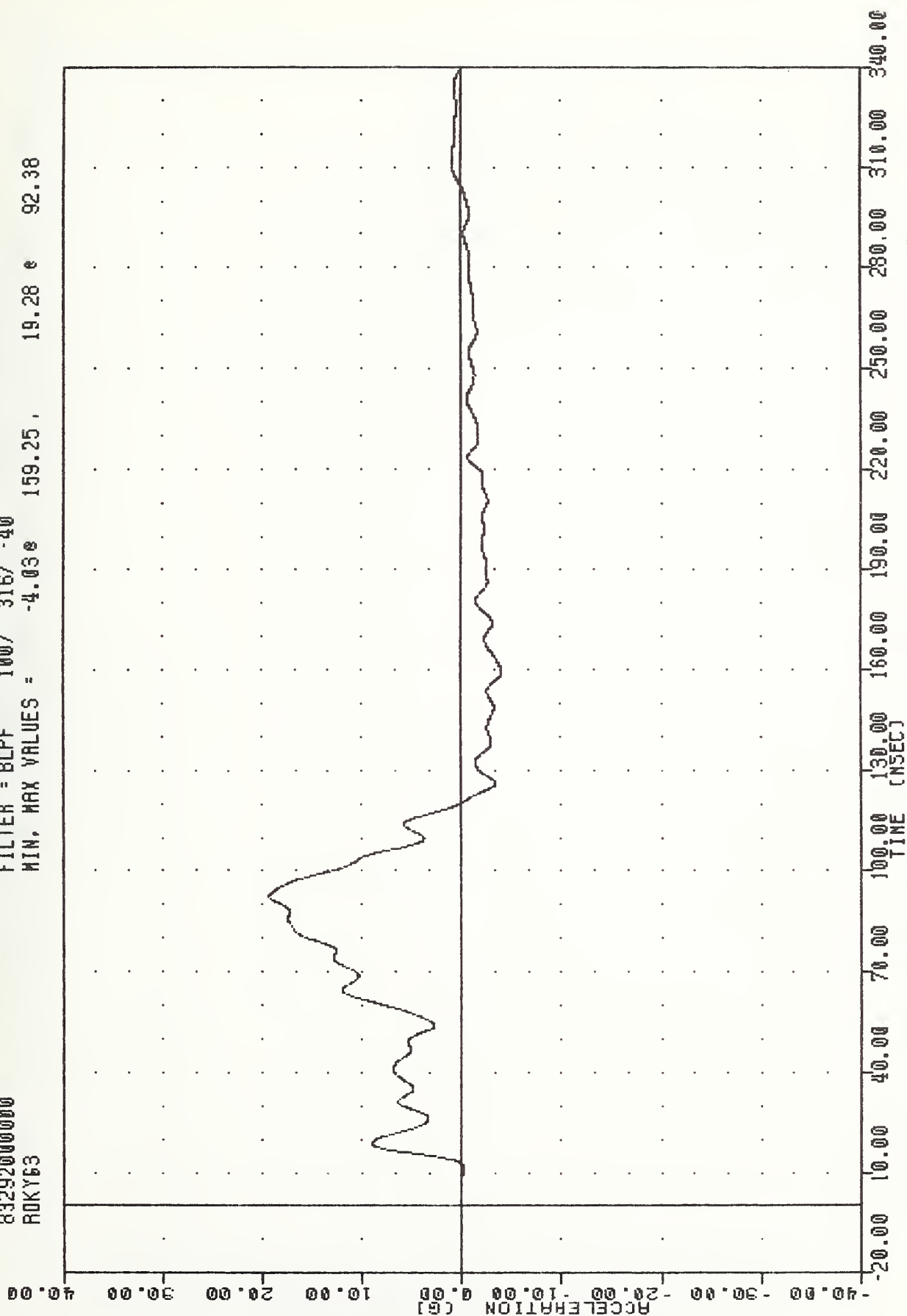
83292000000

R0KY63

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -4.03e 159.25 ,

19.28 e 92.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Y AXIS

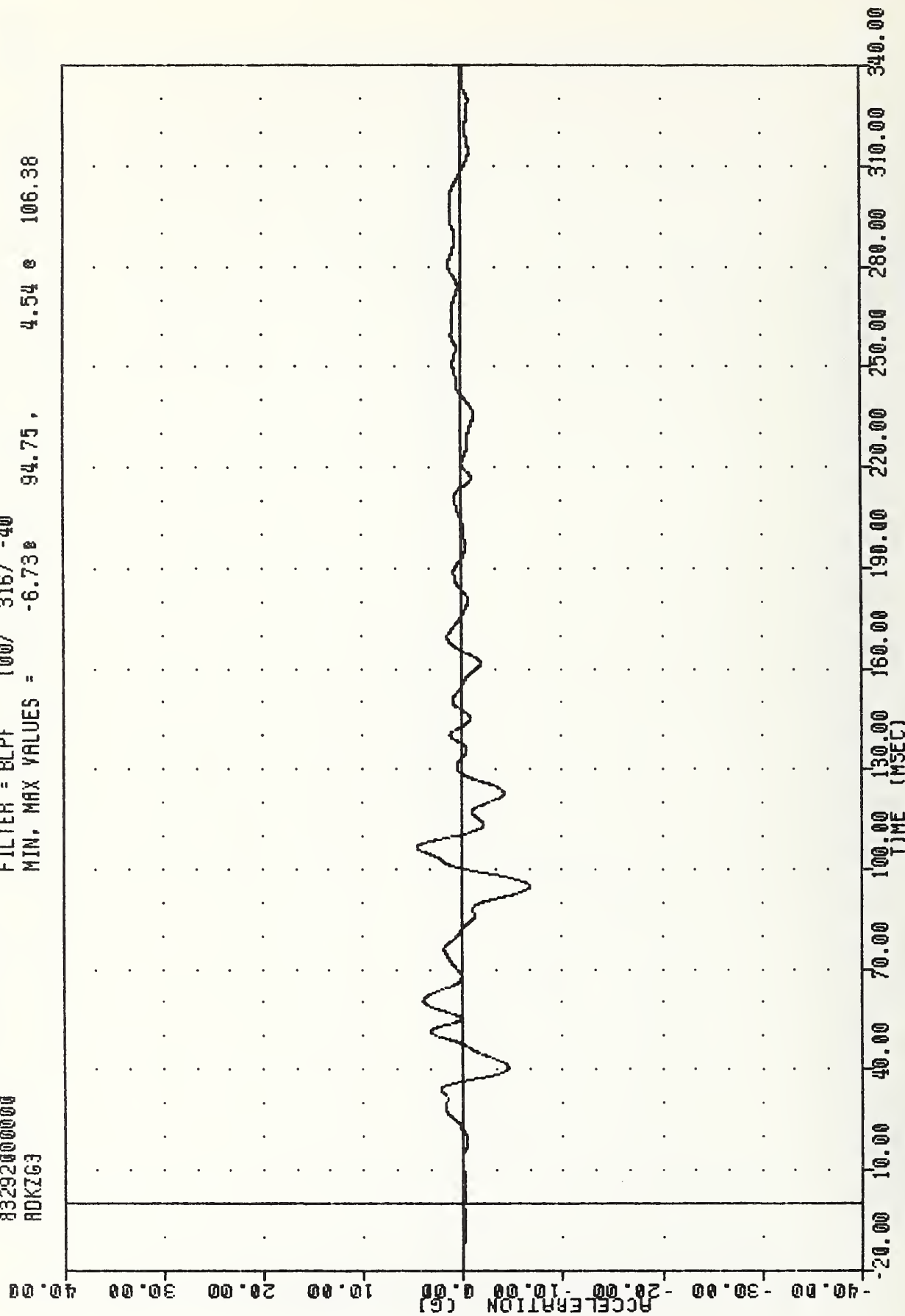
EVALUATION OF MOD YW FLEET

832920000000

ADKZ63

FILTER = BLPF 100/ 316/ -40

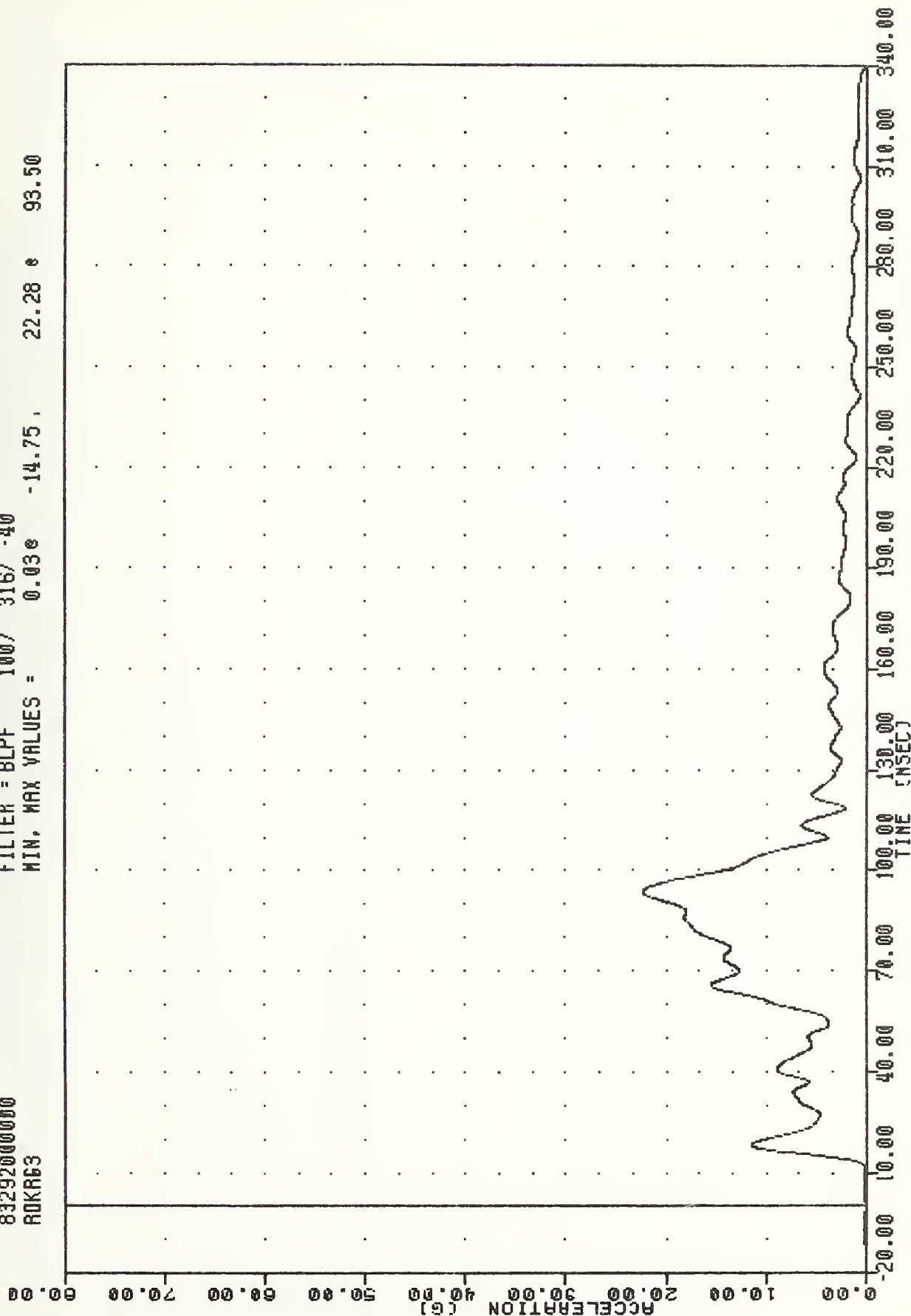
MIN. MAX VALUES = -6.73e 94.75, 4.54 e 106.38



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE REAR DECK ACCELERATION Z AXIS

EVALUATION OF MOD VN FLEET
 832920000000
 ROKR63

FILTER = BLPF 100/ 316/ -40
 MIN, MAX VALUES = 0.03e -14.75, 22.28 e 93.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 VEHICLE REAR DECK RESULTANT

EVALUATION OF MOD VN FLEET

83292000000

ROKXV3

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -8.03e 121.50 , 0.01 e 9.75

100.00

80.00

60.00

40.00

20.00

0.00

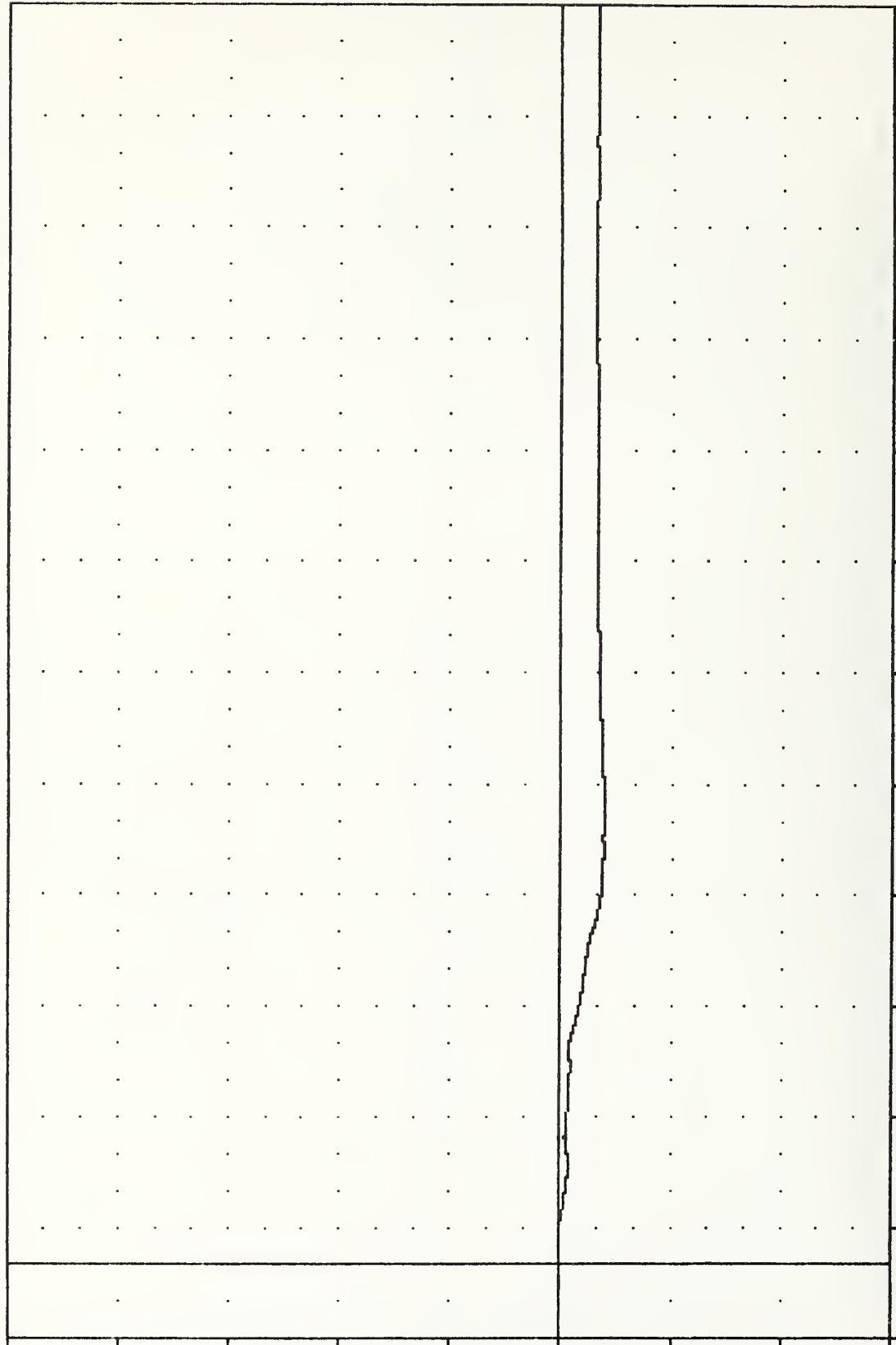
-20.00

-40.00

-60.00

B-86

VELOCITY (MPH)



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING RDKXG3

EVALUATION OF MOD VW FLEET

83292000000

ADKYV3

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 0.00e

10.50 ,

20.85 e

118.63

100.00

80.00

60.00

40.00

20.00

B-87

VELOCITY (MPH)

-20.00

-40.00

-60.00

-80.00

TIME (MSEC)

-20.00

10.00

40.00

70.00

100.00

130.00

160.00

190.00

220.00

250.00

280.00

310.00

340.00

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING RDKYG3

EVALUATION OF MDD VV FLEET

83292000000

LRSYG4

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -5.82e 144.88, 13.11 e 75.38

120.00

90.00

60.00

30.00

0.00

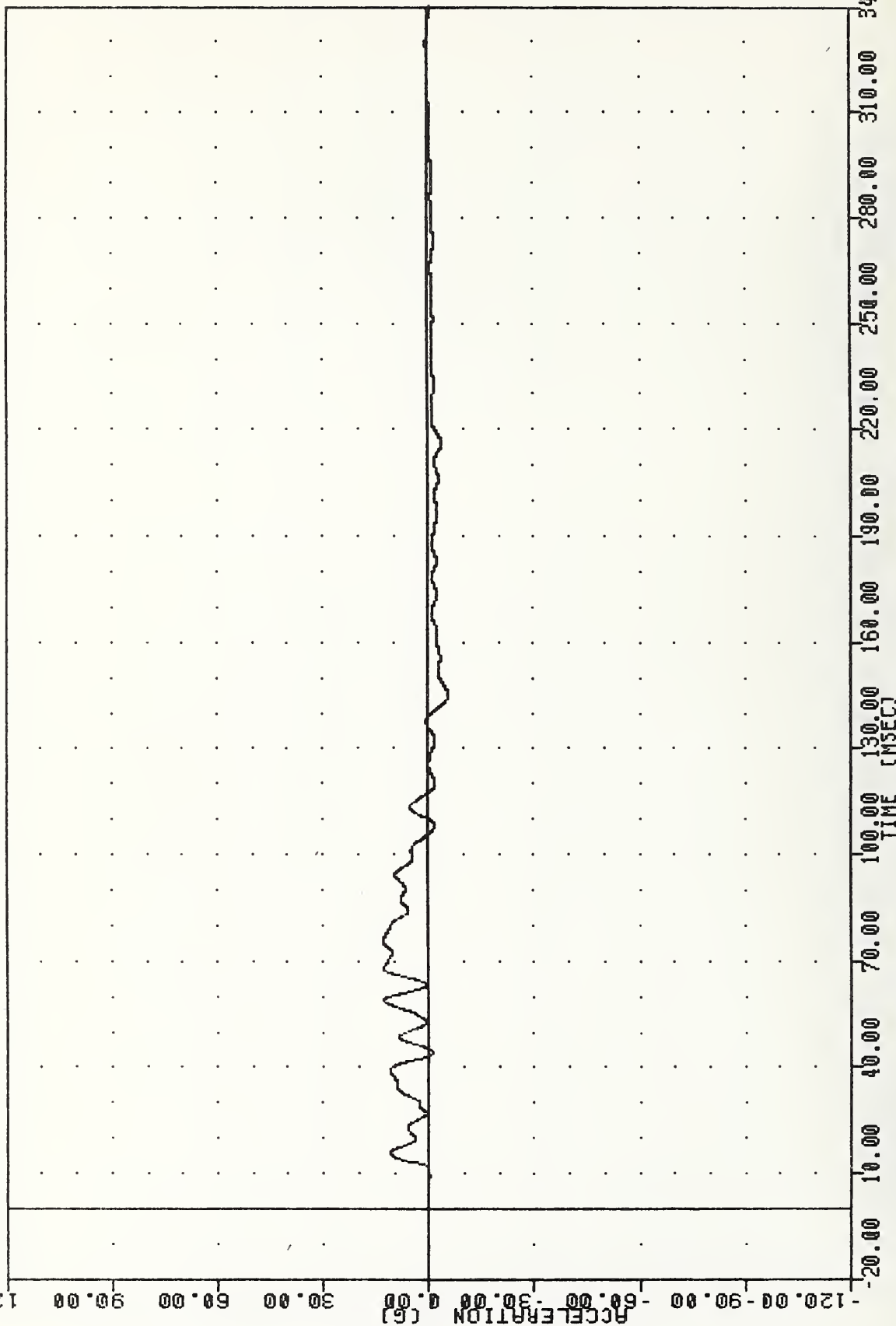
-30.00

-60.00

-90.00

-120.00

B-88



-20.00 10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

EVALUATION OF MOD VV FLEET

83292000000

LRSYV4

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.05e

8.88, 14.16 s 112.00

40.00

30.00

20.00

10.00

0.00

VELOCITY (NPH)

-10.00

-20.00

-30.00

-40.00

-20.00

10.00 40.00 70.00 100.00 130.00 160.00 190.00 220.00 250.00 280.00 310.00 340.00

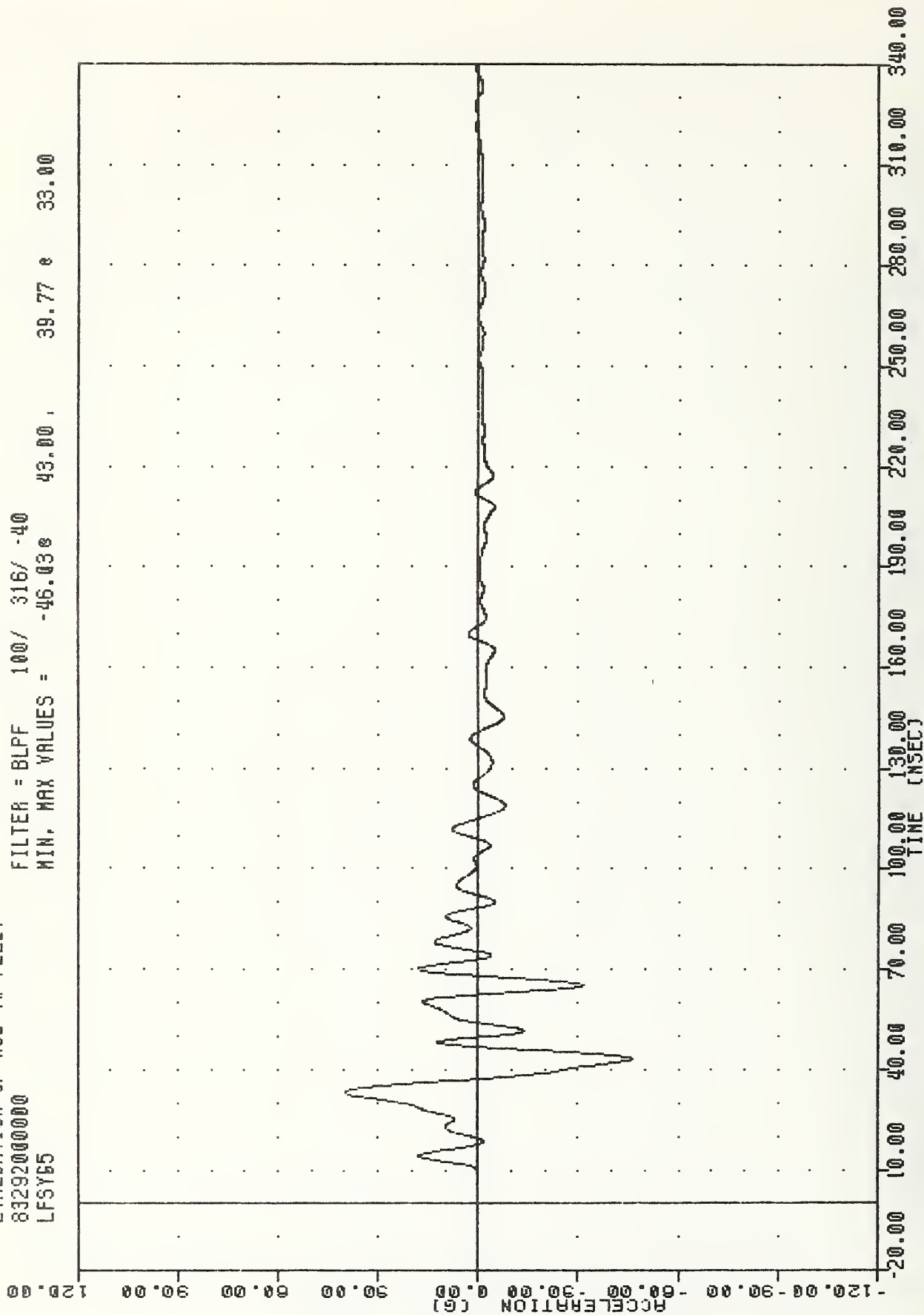
TIME (MSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING LRSYG4

EVALUATION OF MOD VW FLEET
83292000000
LFSY65

FILTER = BLPF 100/ 316/ -40
MIN. MAX VALUES = -46.03e 43.00 , 39.77 e 33.00



B-90

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT SILL ACCELERATION Y AXIS

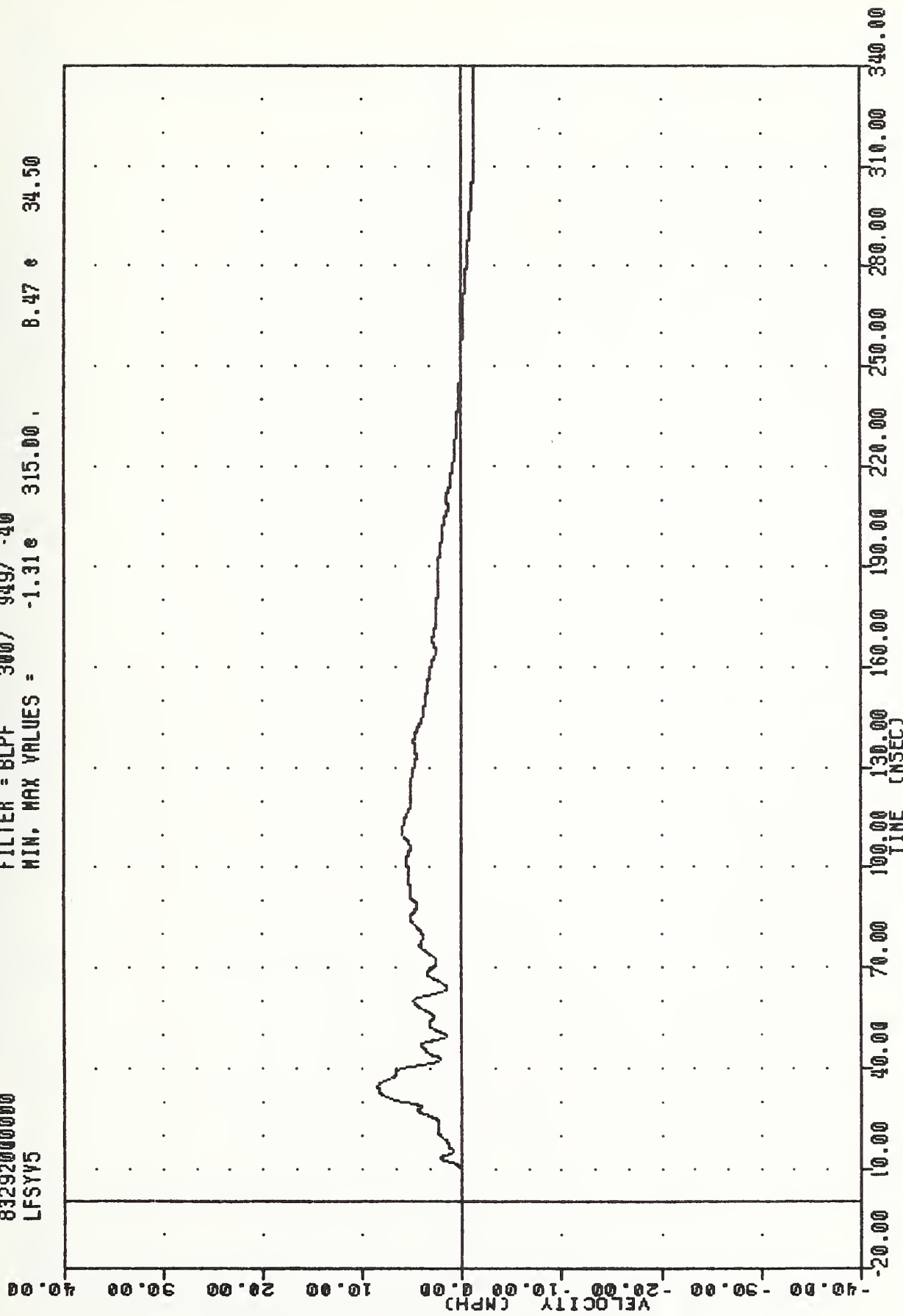
EVALUATION OF MOD VV FLEET

83292000000

LFSYV5

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -1.31e 315.00, 8.47 e 34.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING LFSYG5

EVALUATION OF MOD YW FLEET

832920000000

LFDY61

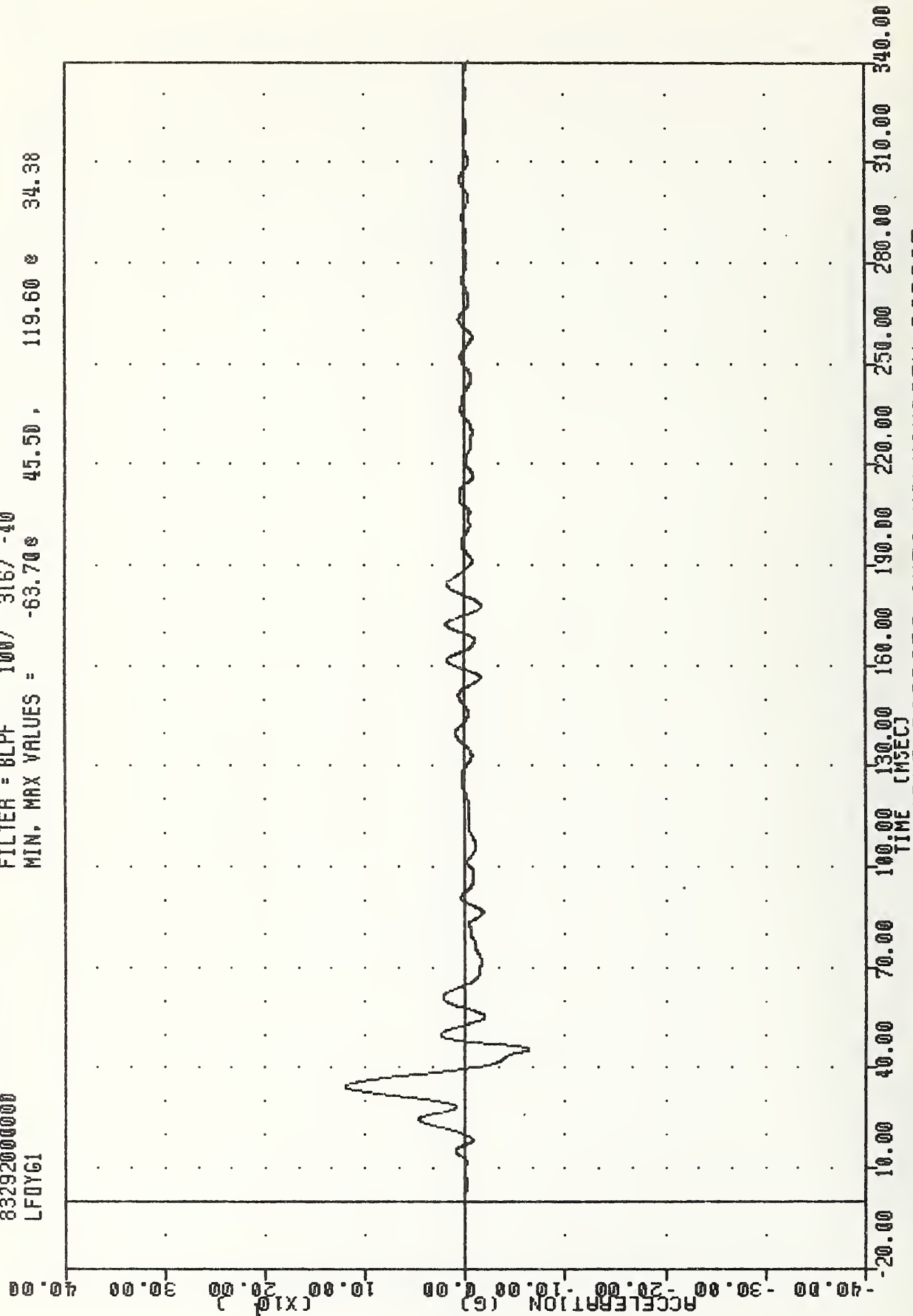
FILTER = 8LPF 100/ 316/ -10

MIN. MAX VALUES = -63.708

45.50 ,

119.60 e

34.38



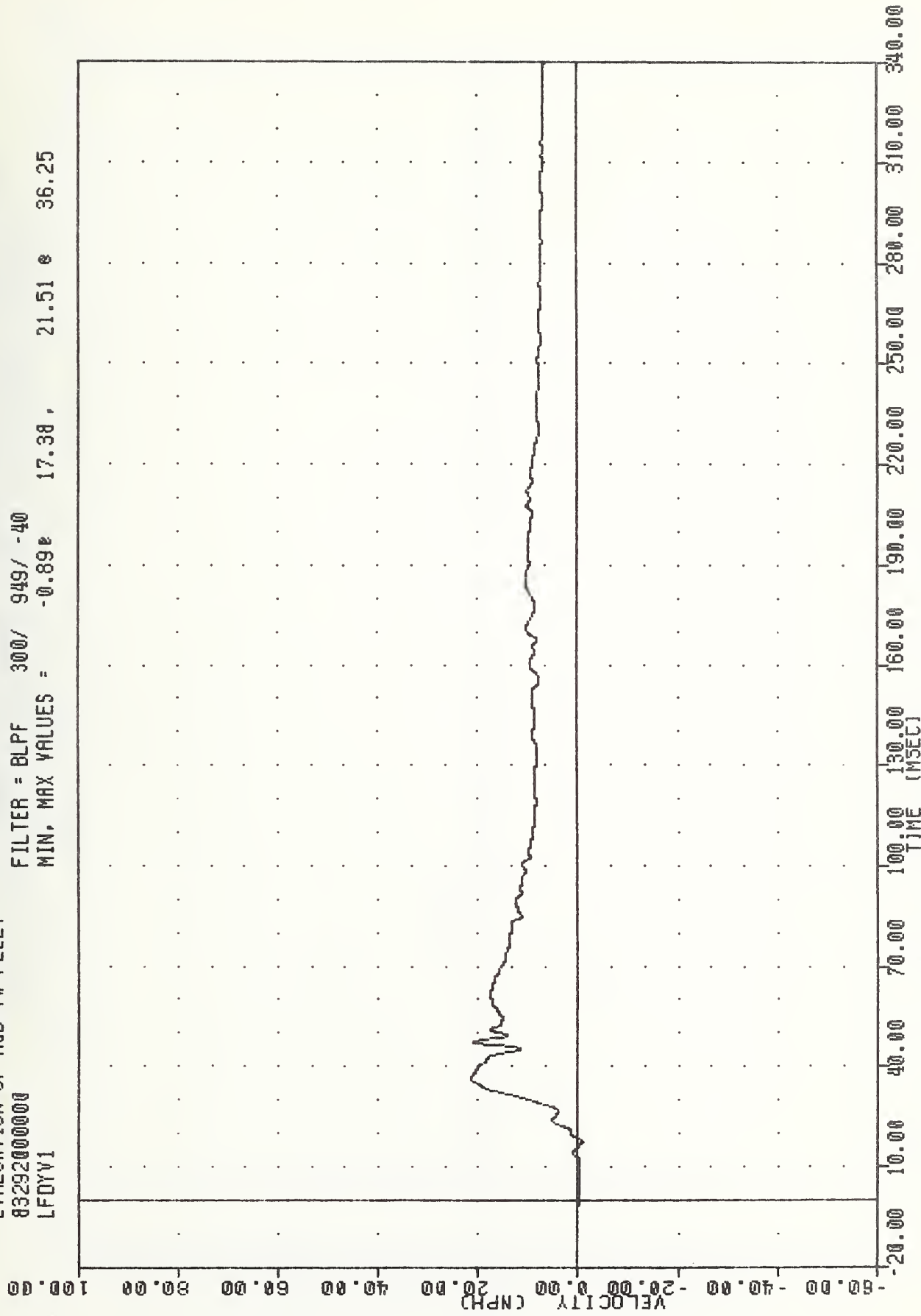
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 6) ACCELERATION Y AXIS

TRC , 831019
 EVALUATION OF MOD VW FLEET
 83292000000
 LFDYV1

PLUT DATE 24-ULI-83 11:11:34

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -0.89e 17.38 , 21.51 e 36.25



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFDYGI

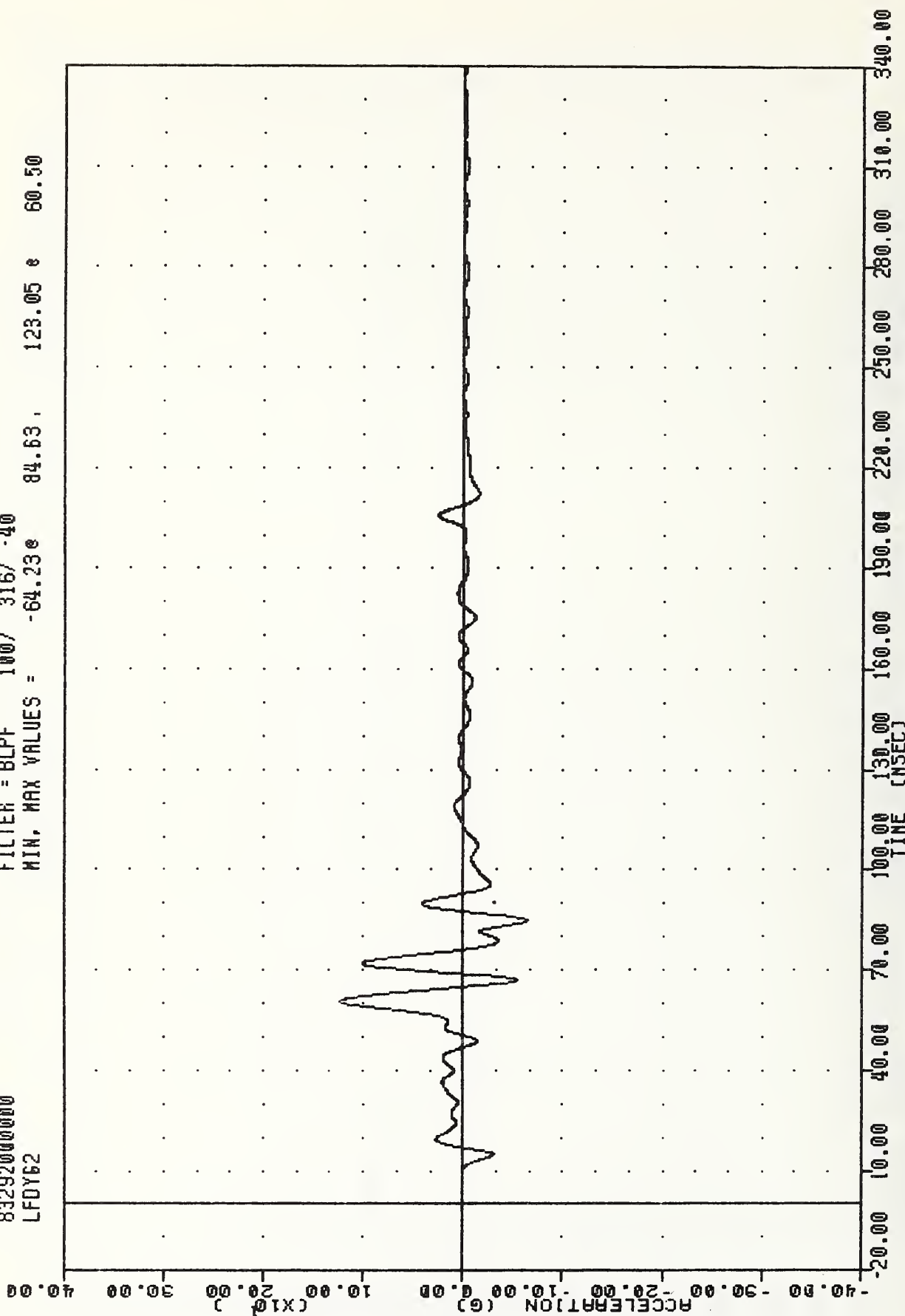
EVALUATION OF MOD VW FLEET

83292000000

LFDY62

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -64.23 84.63 123.05 60.50



B-94

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 8) ACCELERATION Y AXIS

EVALUATION OF MOD YW FLEET

832920000000

LFOYV2

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = -3.42e

14.38,

28.69 e

71.88

100.00

80.00

60.00

40.00

20.00

0.00

-20.00

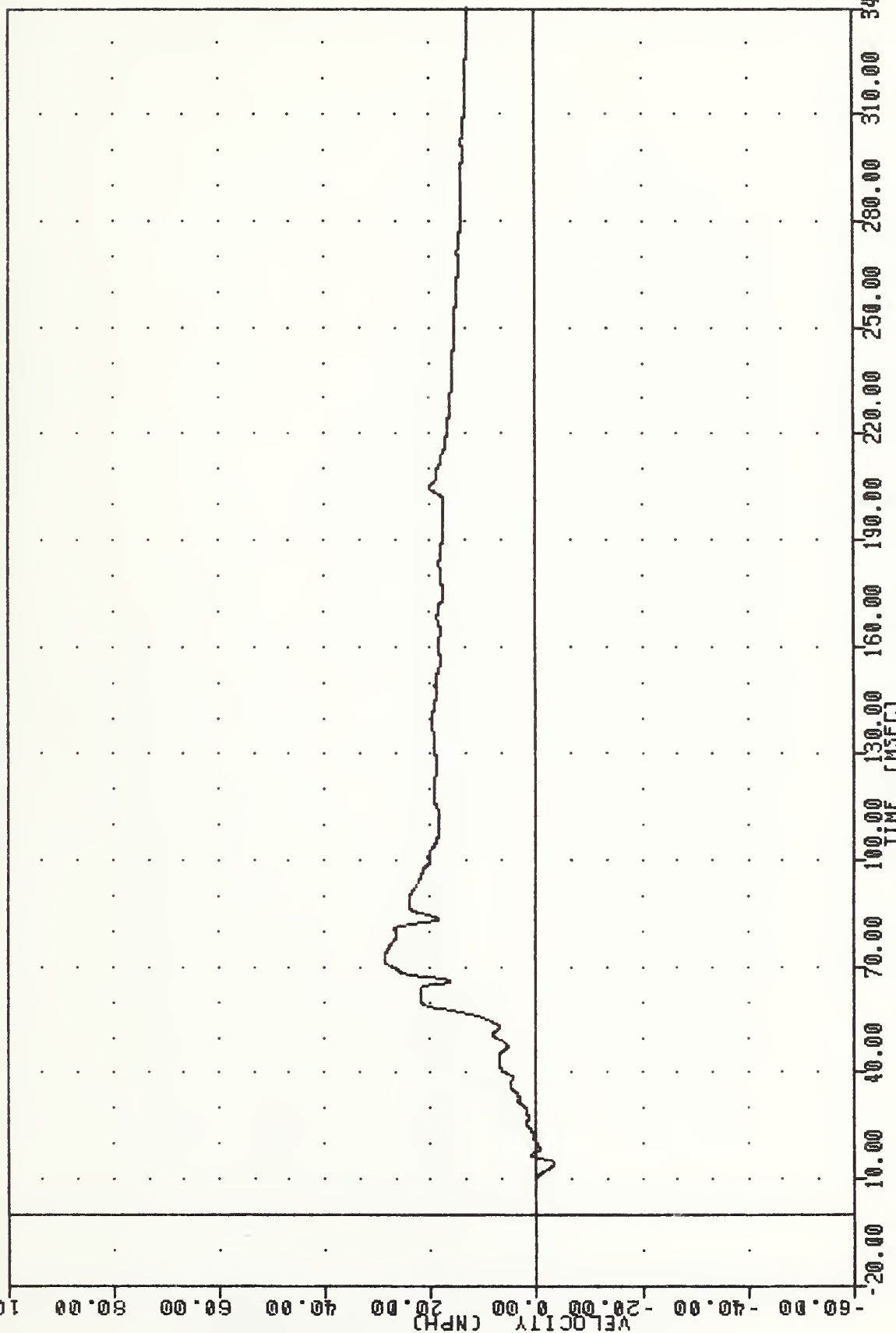
-40.00

-60.00

-80.00

-100.00

B-95



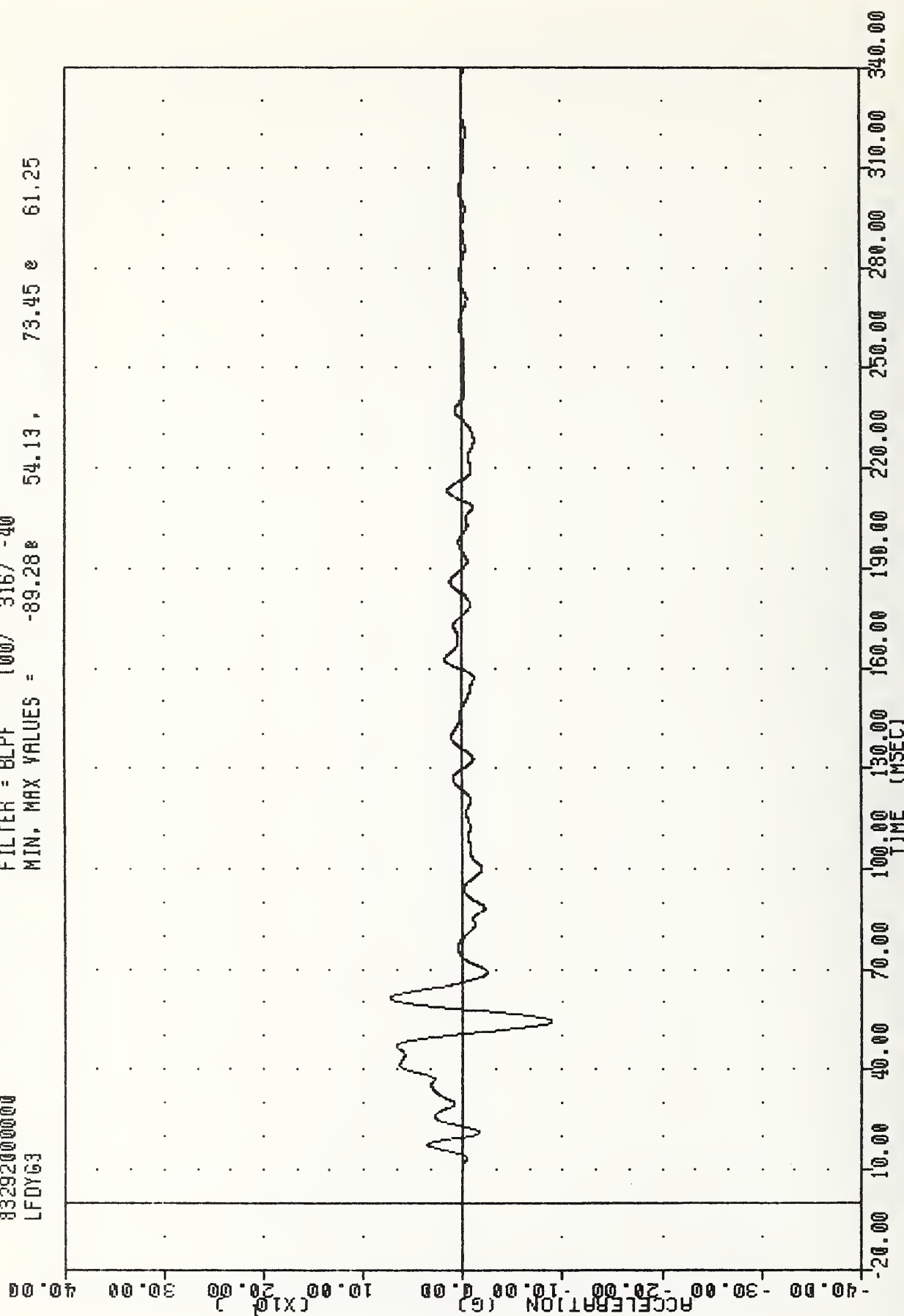
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING LFOYV2

TRC ,831019
 EVALUATION OF MOD VV FLEET
 83292000000
 LFDY63

PLOT DATE 24-UCI-83 08:15:54

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -89.288 54.13, 73.45 e 61.25



EVALUATION OF MOD YW FLEET

83292000000

LFDYV3

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = -0.78 e

19.50 .

24.45 e

46.88

100.00

80.00

60.00

40.00

20.00

0.00

B-97

VELOCITY (NPH)

-20.00

-40.00

-60.00

-80.00

-20.00

10.00

40.00

70.00

100.00

130.00

160.00

190.00

220.00

250.00

280.00

310.00

340.00

TIME (NSEC)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING LFDYV3

EVALUATION OF MOD VW FLEET

83292000000

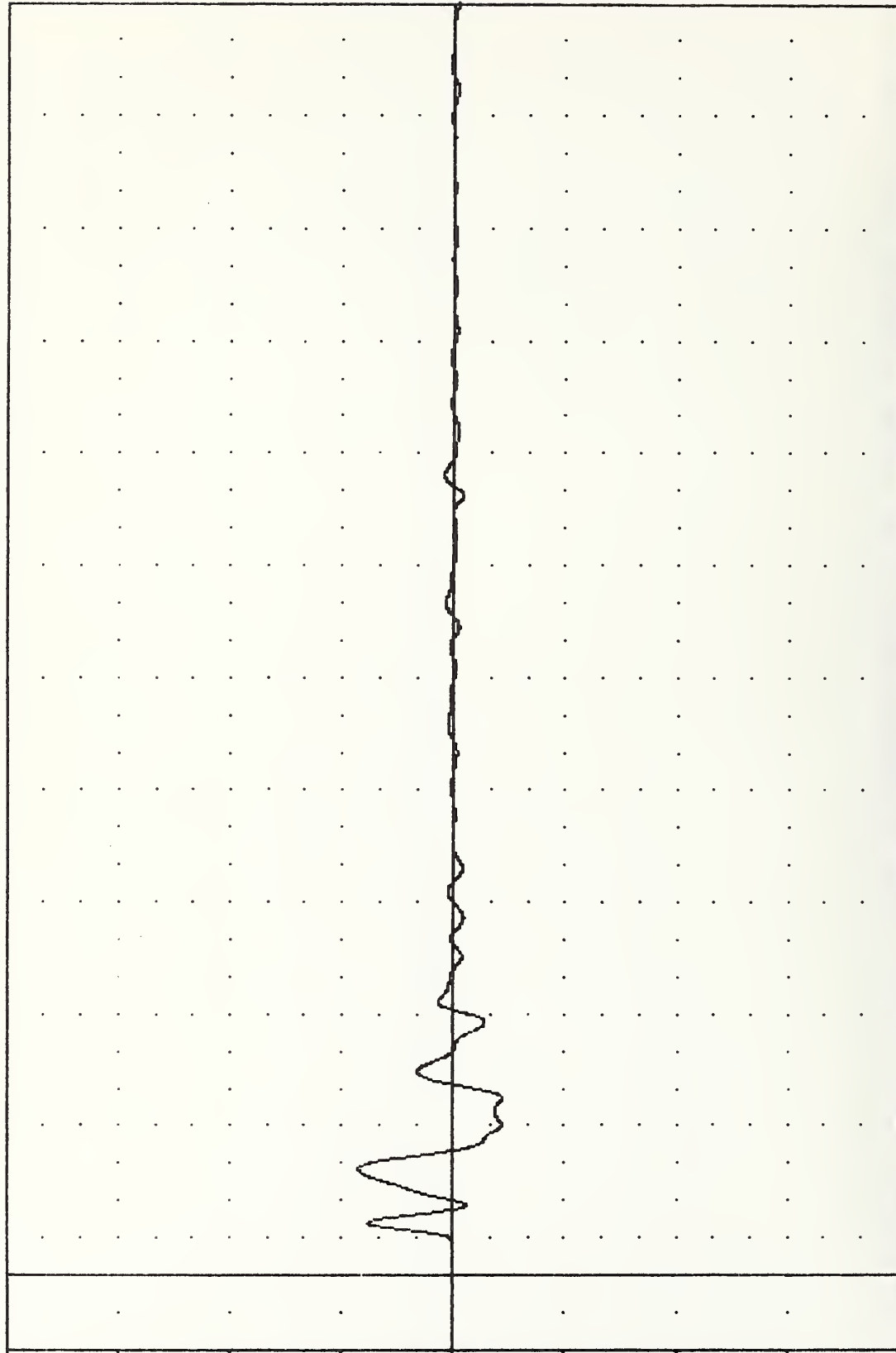
LF0Y64

FILTER = 8LFF 100/ 316/ -40

MIN. MAX VALUES = -44.24e

40.13, 84.80 e 28.25

ACCELERATION (G) (X10⁴)

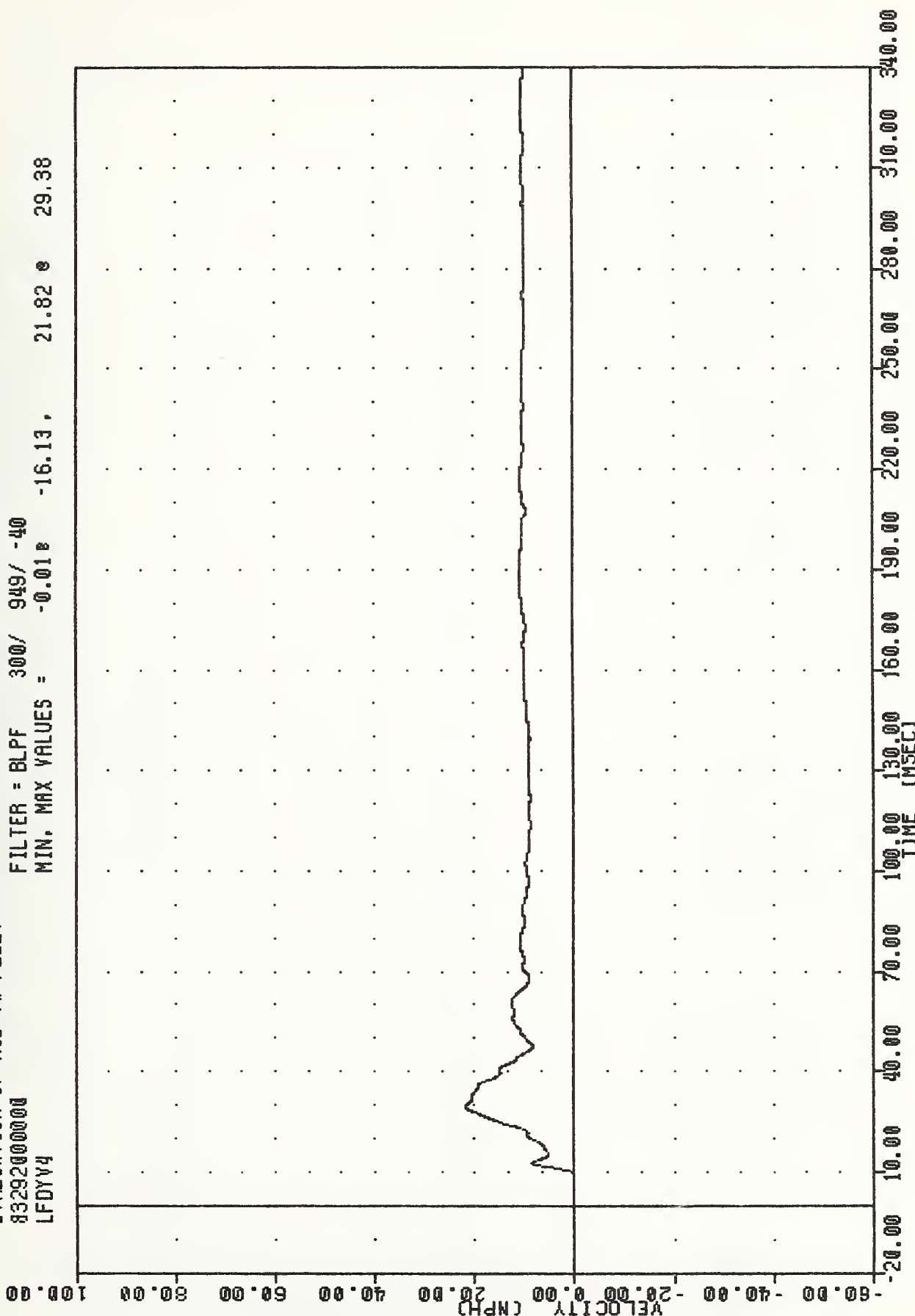


MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 10) ACCELERATION Y AXIS

TRC , 831019
 EVALUATION OF MOD YW FLEET
 832920000000
 LFDYV4

PLOT DATE 24-UL-83 11:11:34

FILTER = BLPF 300/ 949/ -40
 MIN. MAX VALUES = -0.018 -16.13, 21.82 29.38



B-99

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 DELTA V USING LFDYV4

EVALUATION OF MOD VW FLEET

832920000000

LFDY65

FILTER = BLPF 100/ 316/ -40

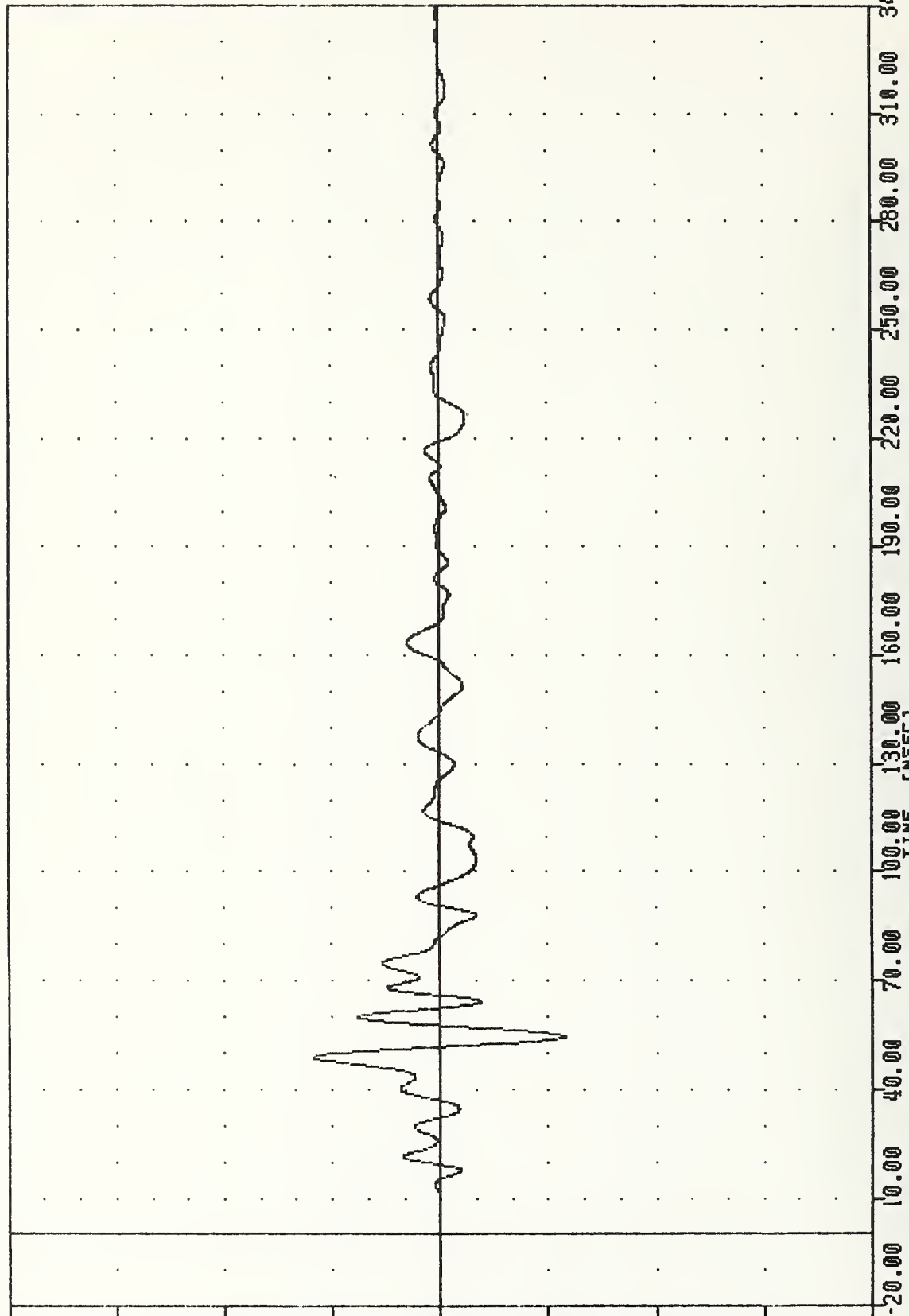
MIN, MAX VALUES = -115.86e

54.38,

117.86 e

48.75

ACCELERATION (g)
(X10⁴)



B-100

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
VEHICLE LEFT FRONT DOOR (POSITION 11) ACCELERATION Y AXIS

EVALUATION OF MOD VW FLEET

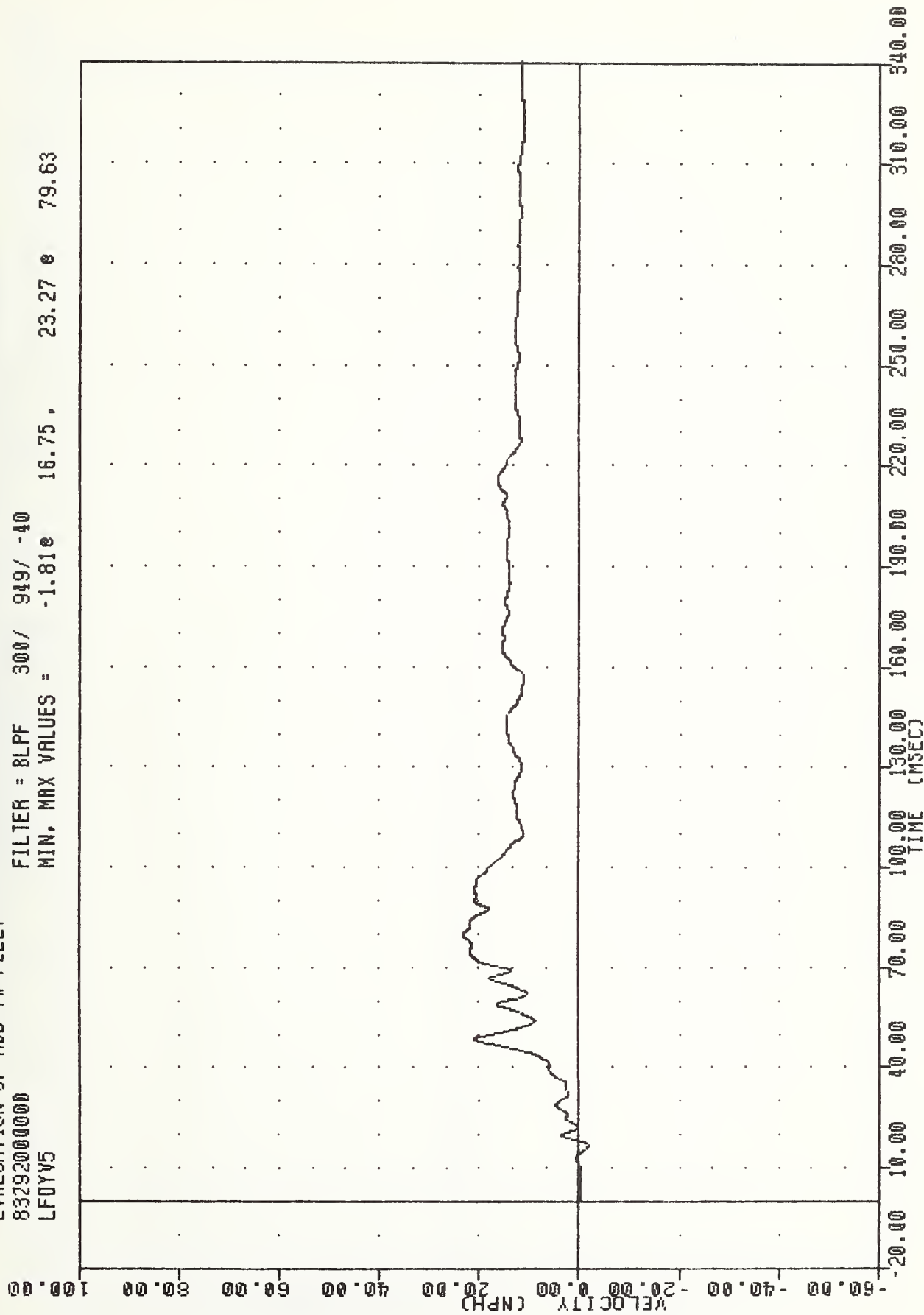
83292000000

LFOYV5

FILTER = 8LPF 300/ 949/ -40

MIN, MAX VALUES = -1.81e

16.75, 23.27 e 79.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

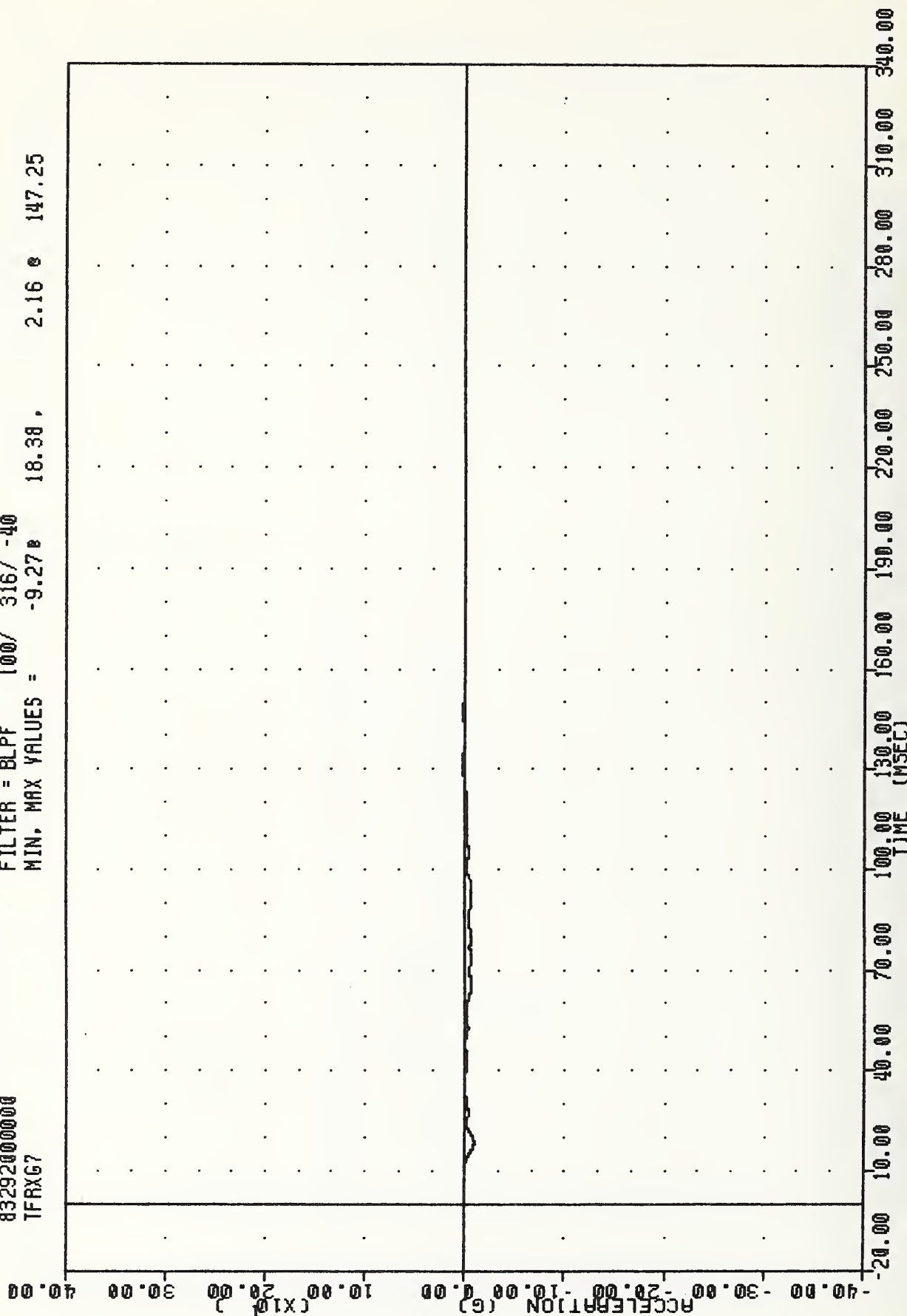
DELTA V USING LFOY65

TRC
EVALUATION OF MOD YW FLEET
83292000000
TFRXG7

PLOT DATE 24-OCT-83 08:15:54

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -9.27 18.38 2.16 147.25



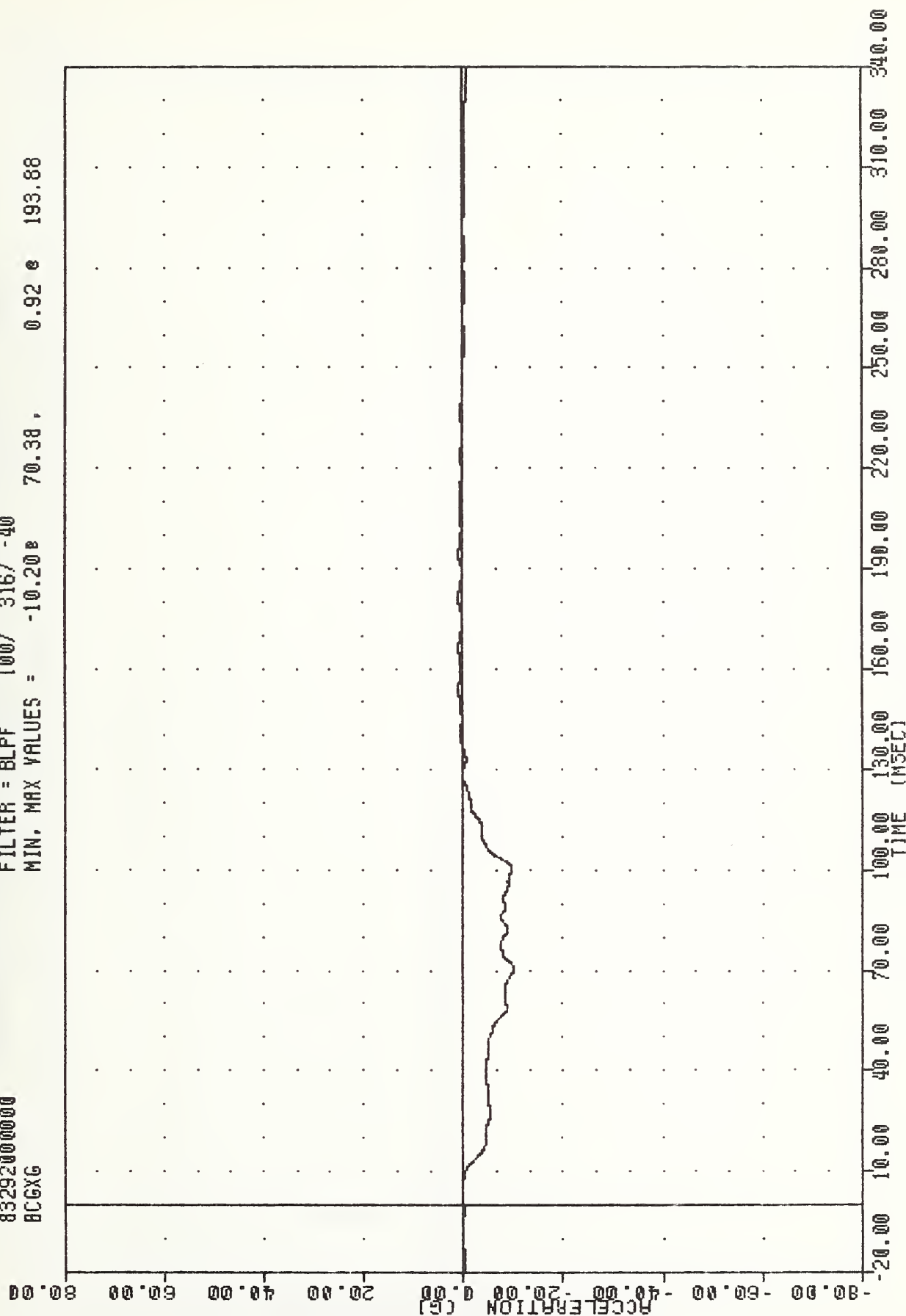
EVALUATION OF MOD VW FLEET

83292000000

BCGXG

FILTER = BLPF 100/ 316/ -40

MIN. MAX VALUES = -10.208 70.38 , 0.92 e 193.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CENTER OF GRAVITY X AXIS

EVALUATION OF MOD VW FLEET

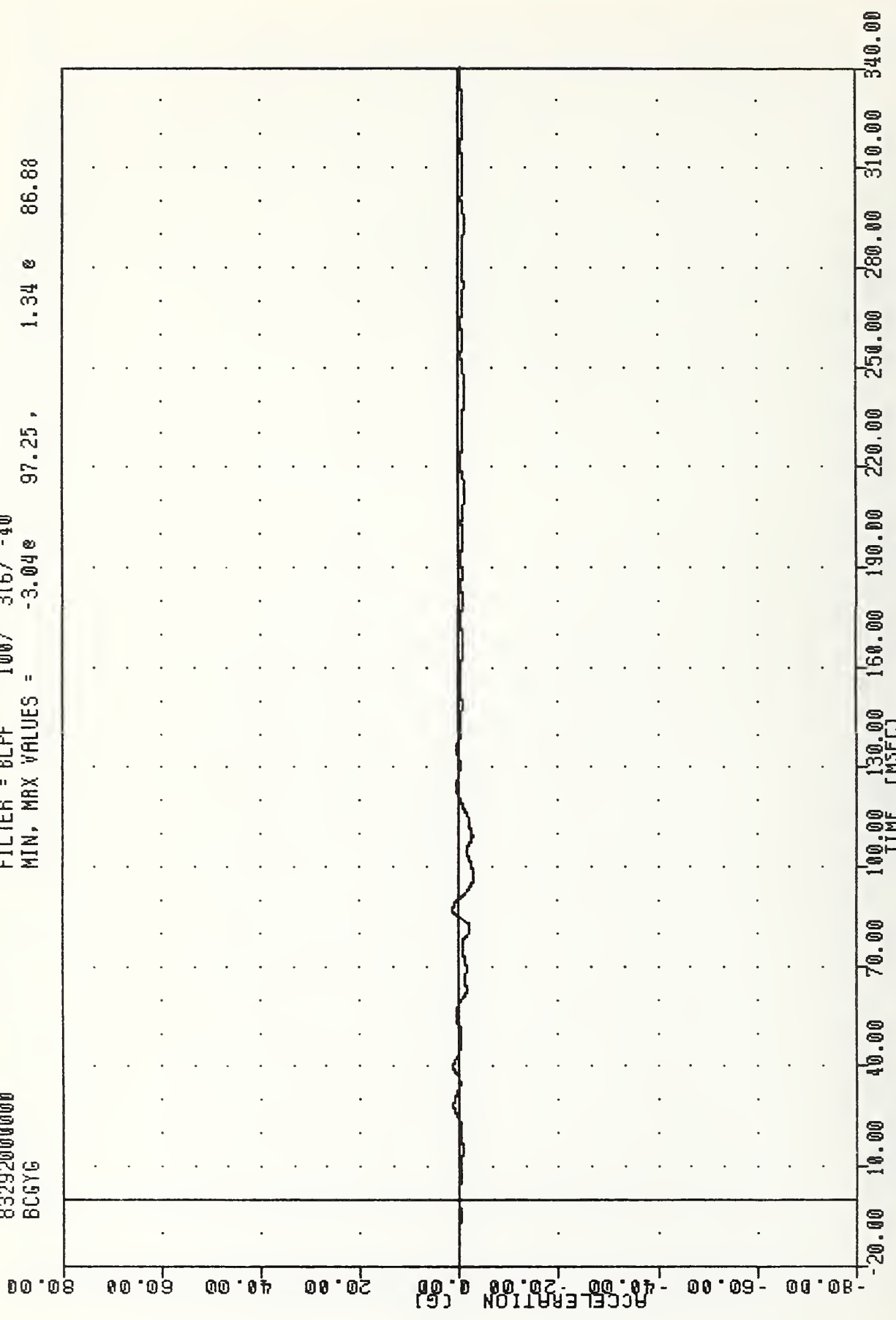
83292000000

BCGYG

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -3.04e

97.25, 1.34 e 86.88



EVALUATION OF MOD VN FLEET

83292000000

BGGZ6

FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -11.38e

78.75, 11.96 e 70.50

80.00

60.00

40.00

20.00

0.00

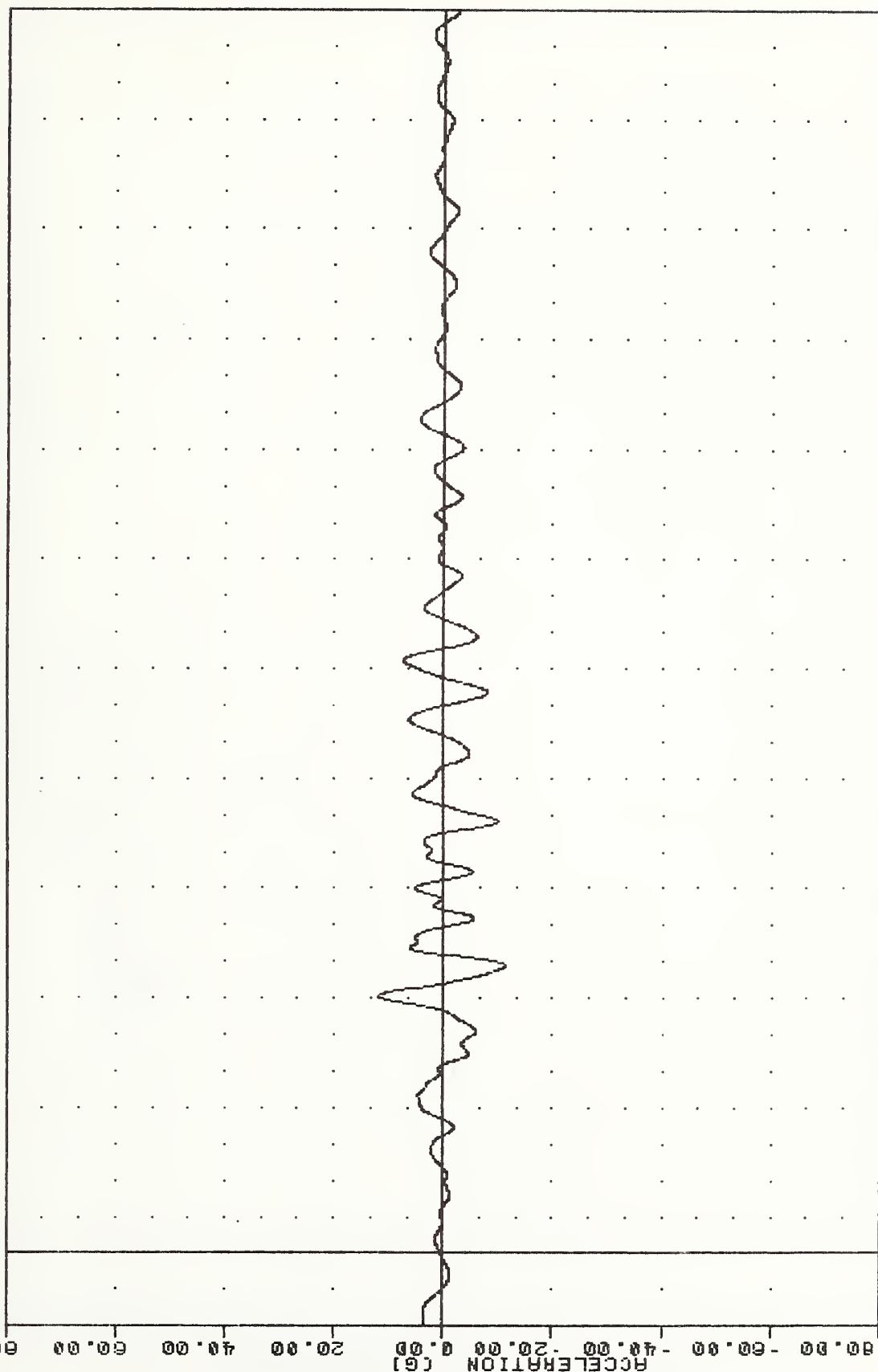
-20.00

-40.00

-60.00

-80.00

B-105



ACCELERATION (G)

TIME (msec)

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CENTER OF GRAVITY Z AXIS

EVALUATION OF MOD YW FLEET

832920000000

BCGAG

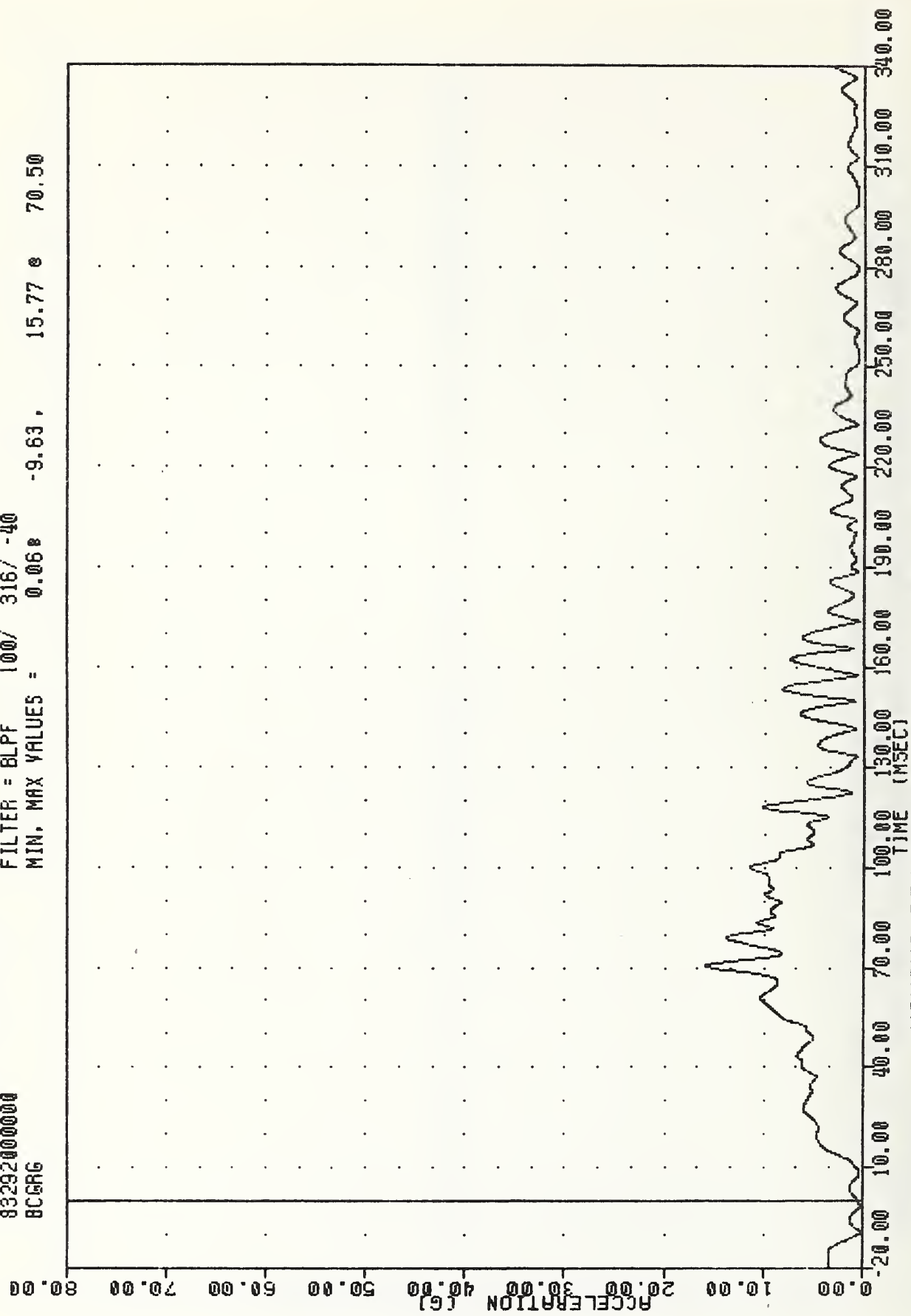
FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = 0.068

-9.63,

15.77 @

70.50



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER CG RESULTANT

EVALUATION OF MOD VW FLEET

83292000000

BCGXV

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 17.36e 130.88, 32.50 e -7.50

60.00

70.00

80.00

90.00

100.00

110.00

120.00

130.00

140.00

150.00

160.00

170.00

180.00

190.00

200.00

210.00

220.00

230.00

240.00

250.00

260.00

270.00

280.00

290.00

300.00

310.00

320.00

330.00

340.00

350.00

360.00

370.00

380.00

390.00

400.00

410.00

420.00

430.00

440.00

450.00

460.00

470.00

480.00

490.00

500.00

510.00

520.00

530.00

540.00

550.00

560.00

570.00

580.00

590.00

600.00

610.00

620.00

630.00

640.00

650.00

660.00

670.00

680.00

690.00

700.00

710.00

720.00

730.00

740.00

750.00

760.00

770.00

780.00

790.00

800.00

810.00

820.00

830.00

840.00

850.00

860.00

870.00

880.00

890.00

900.00

910.00

920.00

930.00

940.00

950.00

960.00

970.00

980.00

990.00

1000.00

1010.00

1020.00

1030.00

1040.00

1050.00

1060.00

1070.00

1080.00

1090.00

1100.00

1110.00

1120.00

1130.00

1140.00

1150.00

1160.00

1170.00

1180.00

1190.00

1200.00

1210.00

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1250.00

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1290.00

1300.00

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1560.00

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1580.00

1590.00

1600.00

1610.00

1620.00

1630.00

1640.00

1650.00

1660.00

1670.00

1680.00

1690.00

1700.00

1710.00

1720.00

1730.00

1740.00

1750.00

1760.00

1770.00

1780.00

1790.00

1800.00

1810.00

1820.00

1830.00

1840.00

1850.00

1860.00

1870.00

1880.00

1890.00

1900.00

1910.00

1920.00

1930.00

1940.00

1950.00

1960.00

1970.00

1980.00

1990.00

2000.00

2010.00

2020.00

2030.00

2040.00

2050.00

2060.00

2070.00

2080.00

2090.00

2100.00

2110.00

2120.00

2130.00

2140.00

2150.00

2160.00

2170.00

2180.00

2190.00

2200.00

2210.00

2220.00

2230.00

2240.00

2250.00

2260.00

2270.00

2280.00

2290.00

2300.00

2310.00

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2480.00

2490.00

2500.00

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2520.00

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2540.00

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2560.00

2570.00

2580.00

2590.00

2600.00

2610.00

2620.00

2630.00

2640.00

2650.00

2660.00

2670.00

2680.00

2690.00

2700.00

2710.00

2720.00

2730.00

2740.00

2750.00

2760.00

2770.00

2780.00

2790.00

2800.00

2810.00

2820.00

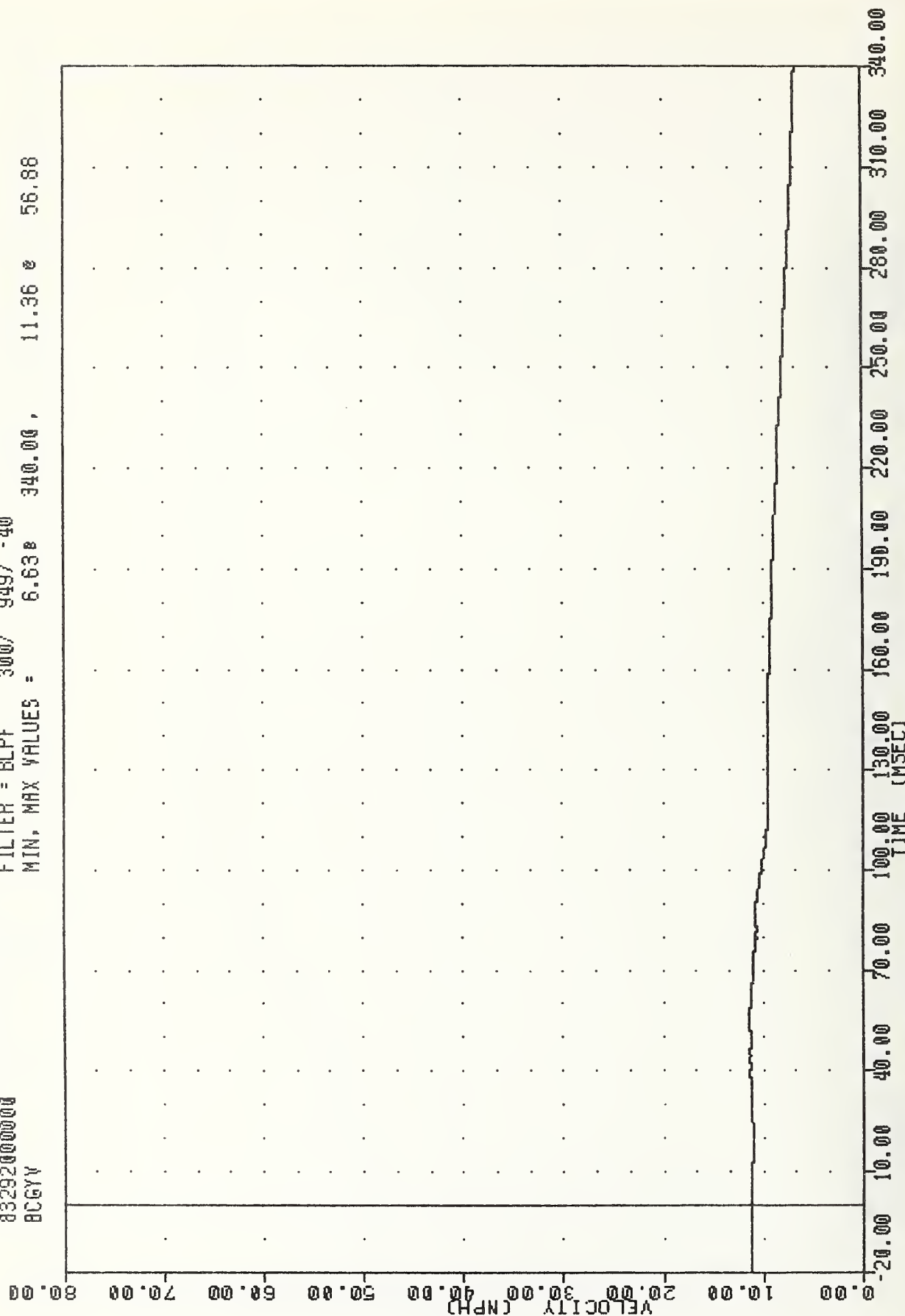
EVALUATION OF MOD VW FLEET

832920000000

BCGYG

FILTER = BLPF 300/ 949/ -40

MIN, MAX VALUES = 6.63e 340.00, 11.36 e 56.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

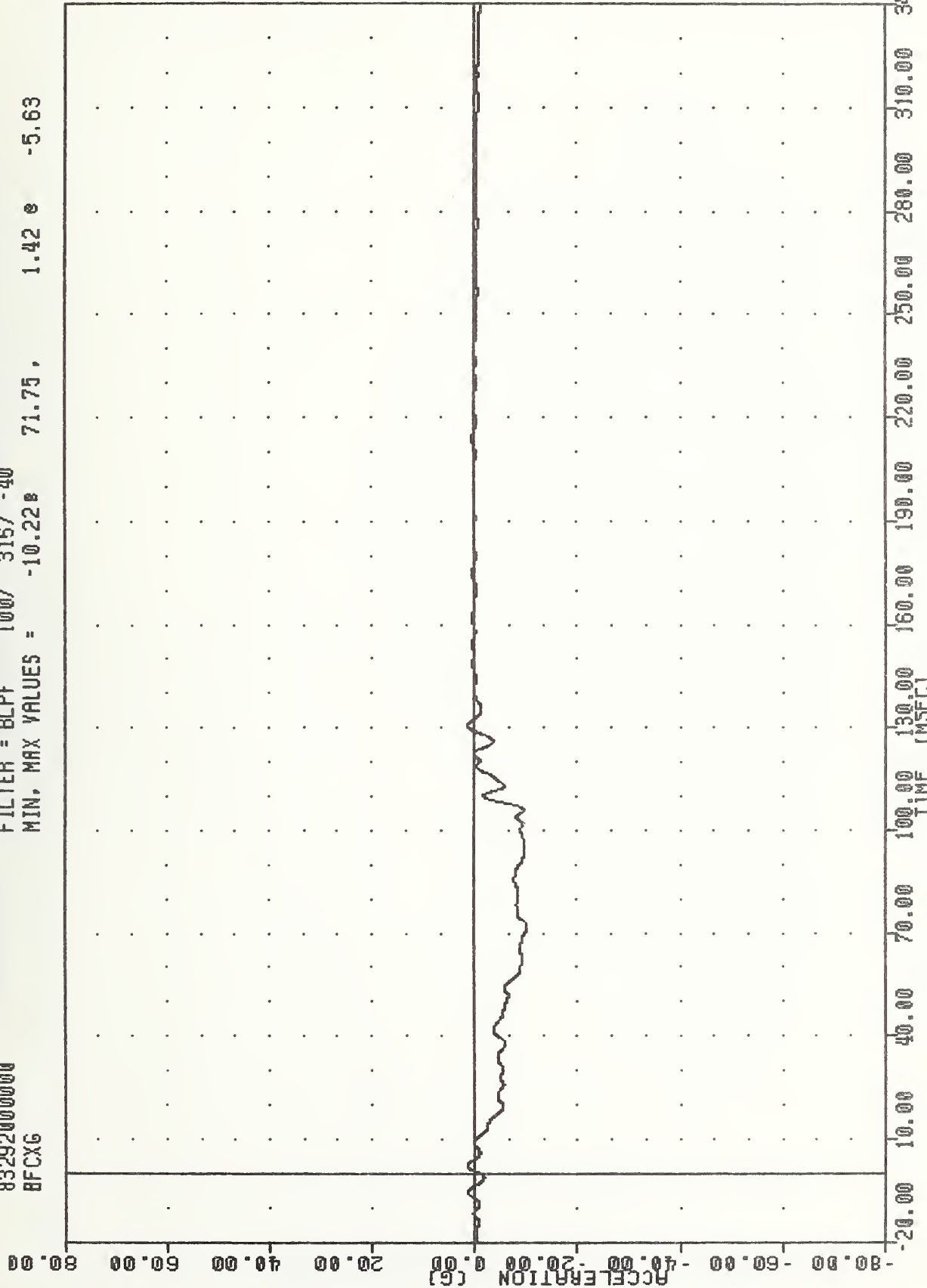
DELTA V USING BCGYG

IHC
 EVALUATION OF MOD VV FLEET
 83292000000
 BFCXG

FLUI UNIE 24-ULI-03 08:13:04

FILTER = BLPF 100/ 315/ -40

MIN, MAX VALUES = -10.22g 71.75, 1.42 g -5.63



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
 BARRIER FRONT CROSSMEMBER ACCELERATION X AXIS

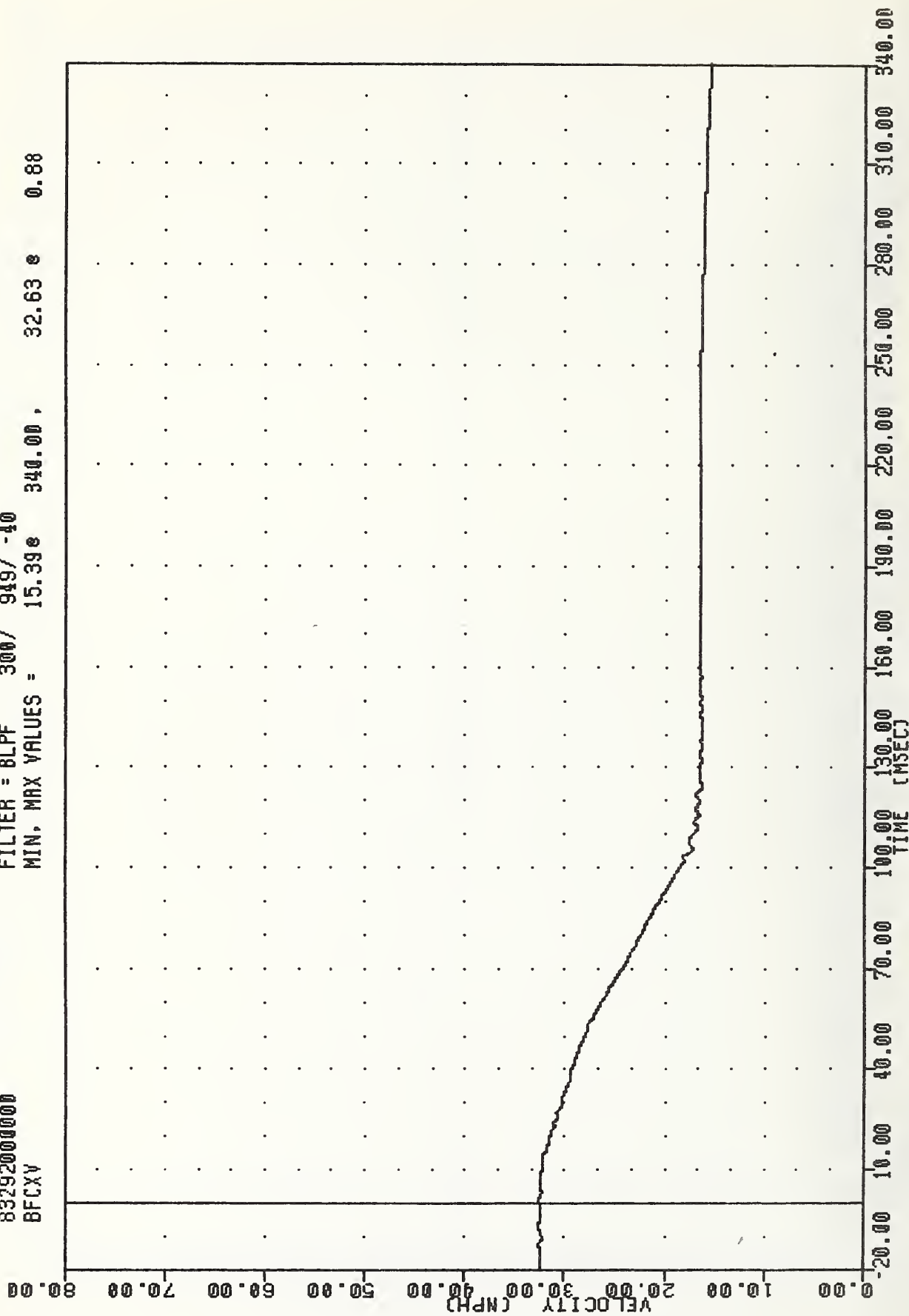
EVALUATION OF MDD VW FLEET

83292000000

BFCXV

FILTER = 8LPF 300/ 949/ -40

MIN. MAX VALUES = 15.39e 340.00 , 32.63 e 0.88



MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT

DELTA V USING BFCXG

EVALUATION OF MDD VW FLEET

832920000000

BRCXG

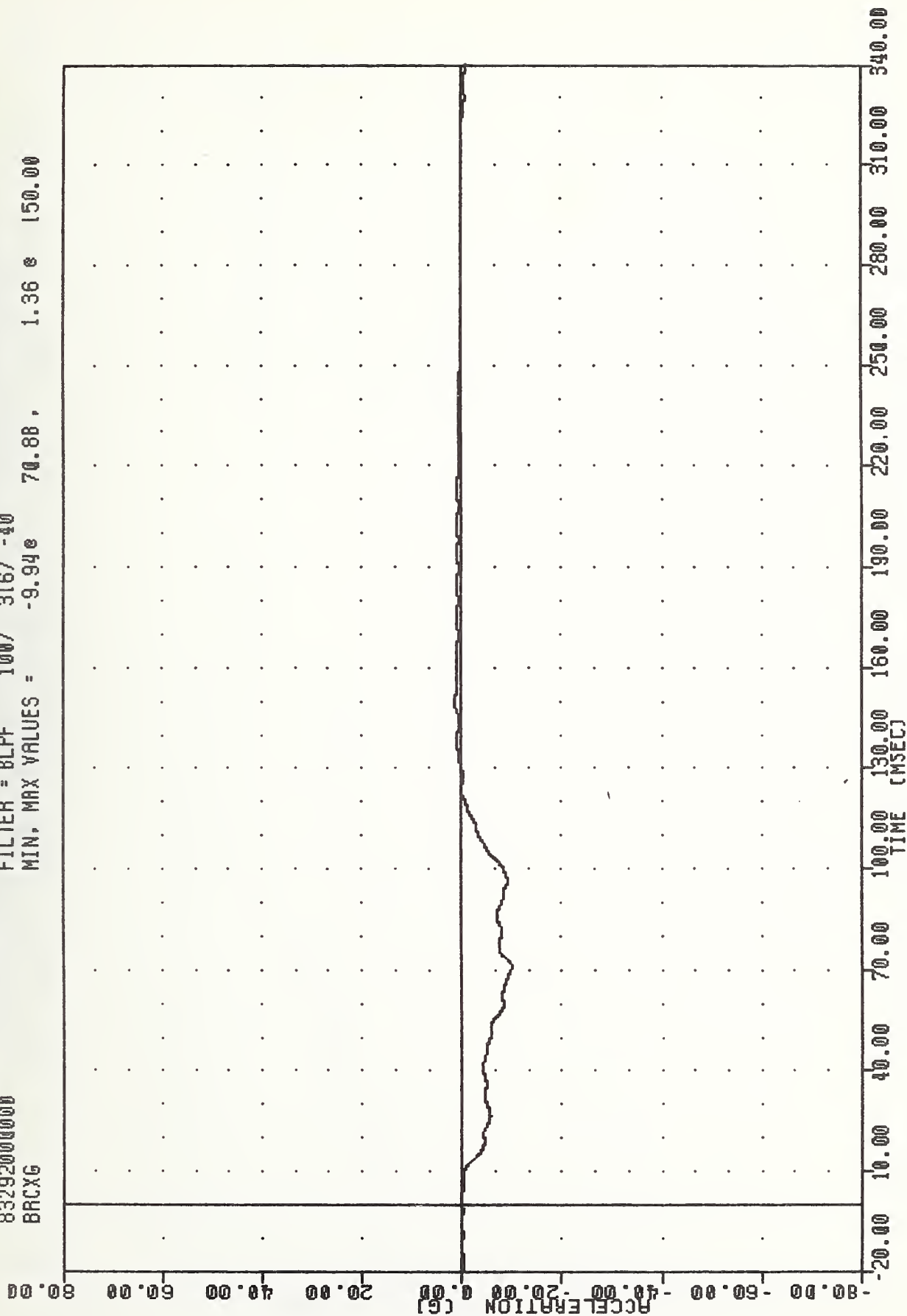
FILTER = BLPF 100/ 316/ -40

MIN, MAX VALUES = -9.94e

70.88,

1.36 e

150.00



B-111

MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
BARRIER REAR CROSSMEMBER ACCELERATION X AXIS

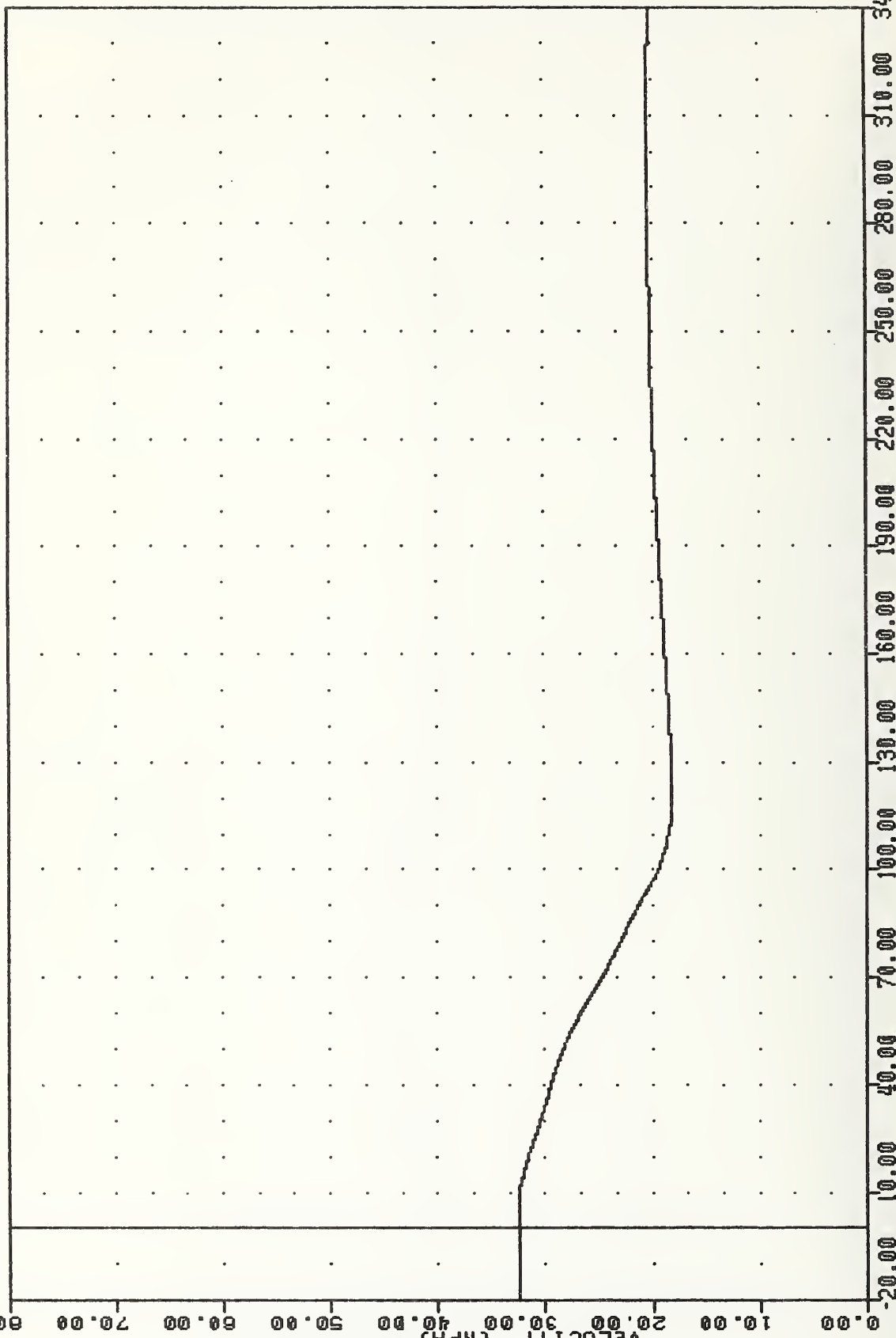
INC
EVALUATION OF MOD VV FLEET
83292000000
BRCXY

PLU1 DATE 24-OCT-83 11:11:34

FILTER = BLPF 300/ 949/ -40

MIN. MAX VALUES = 18.16s 124.75 , 32.50 s -20.00

VELOCITY (MPH)

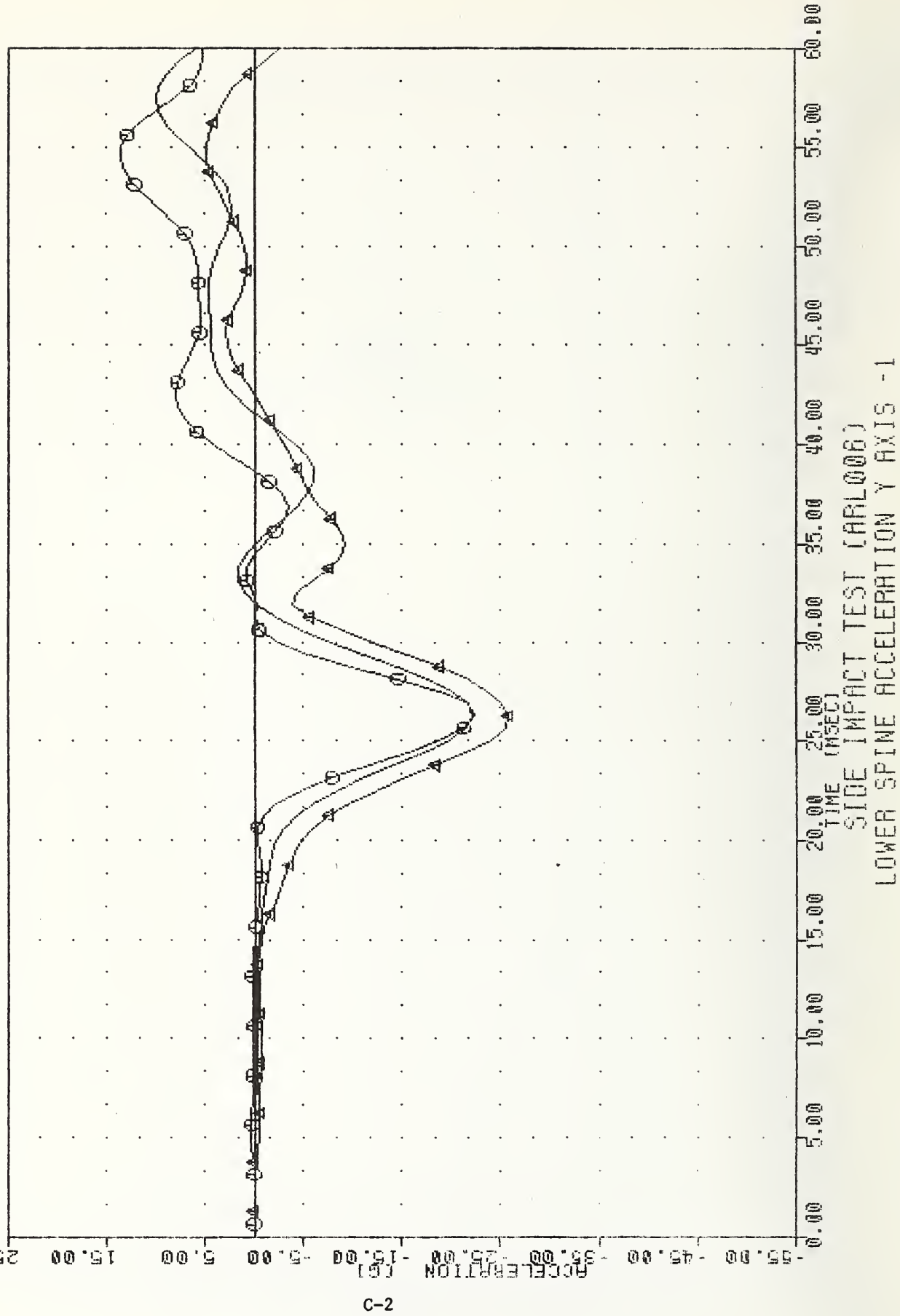


B-112

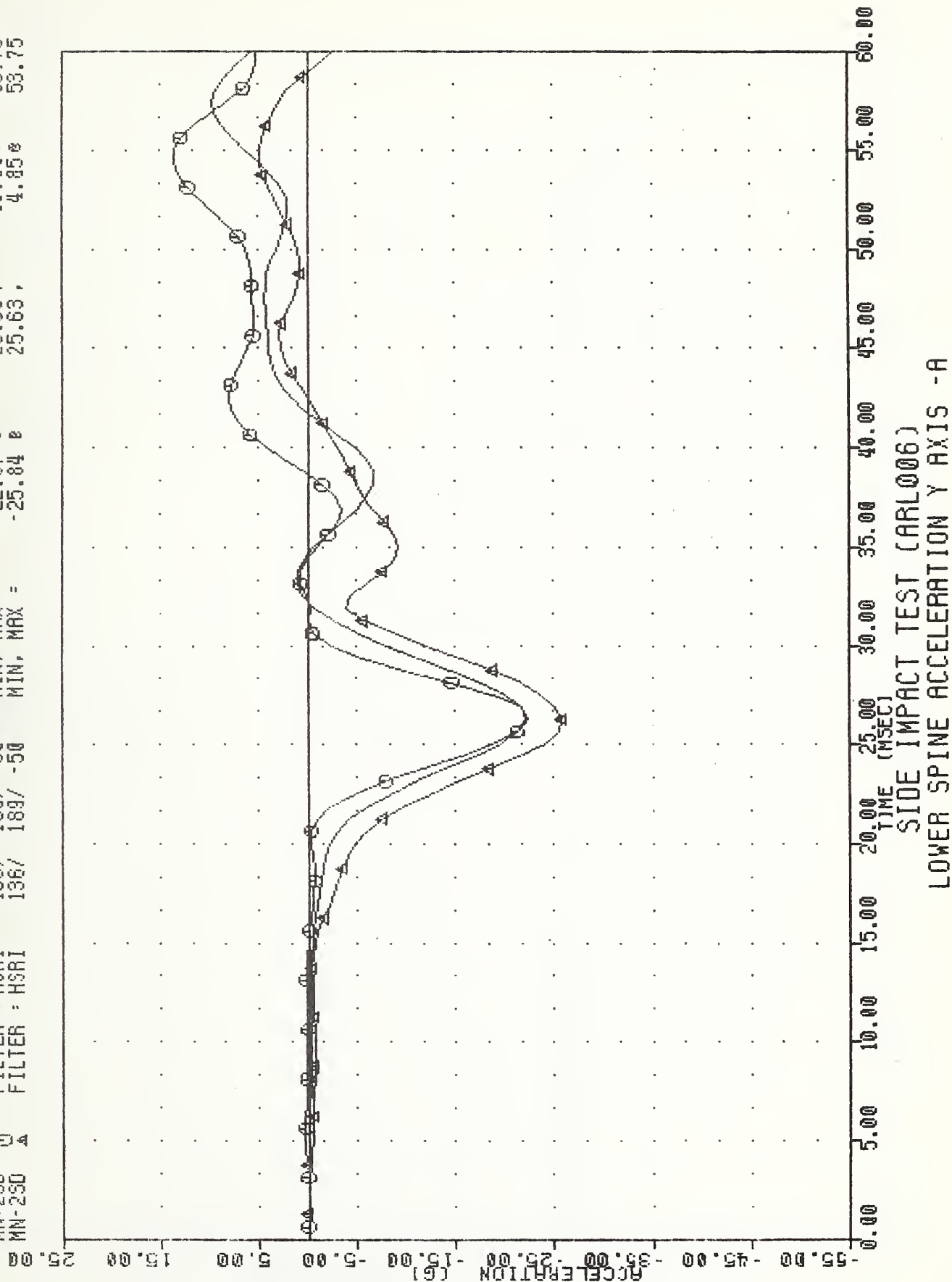
MOVING DEFORMABLE BARRIER INTO VOLKSWAGEN RABBIT
DELTA V USING BRCXG

APPENDIX C
DUMMY CERTIFICATION

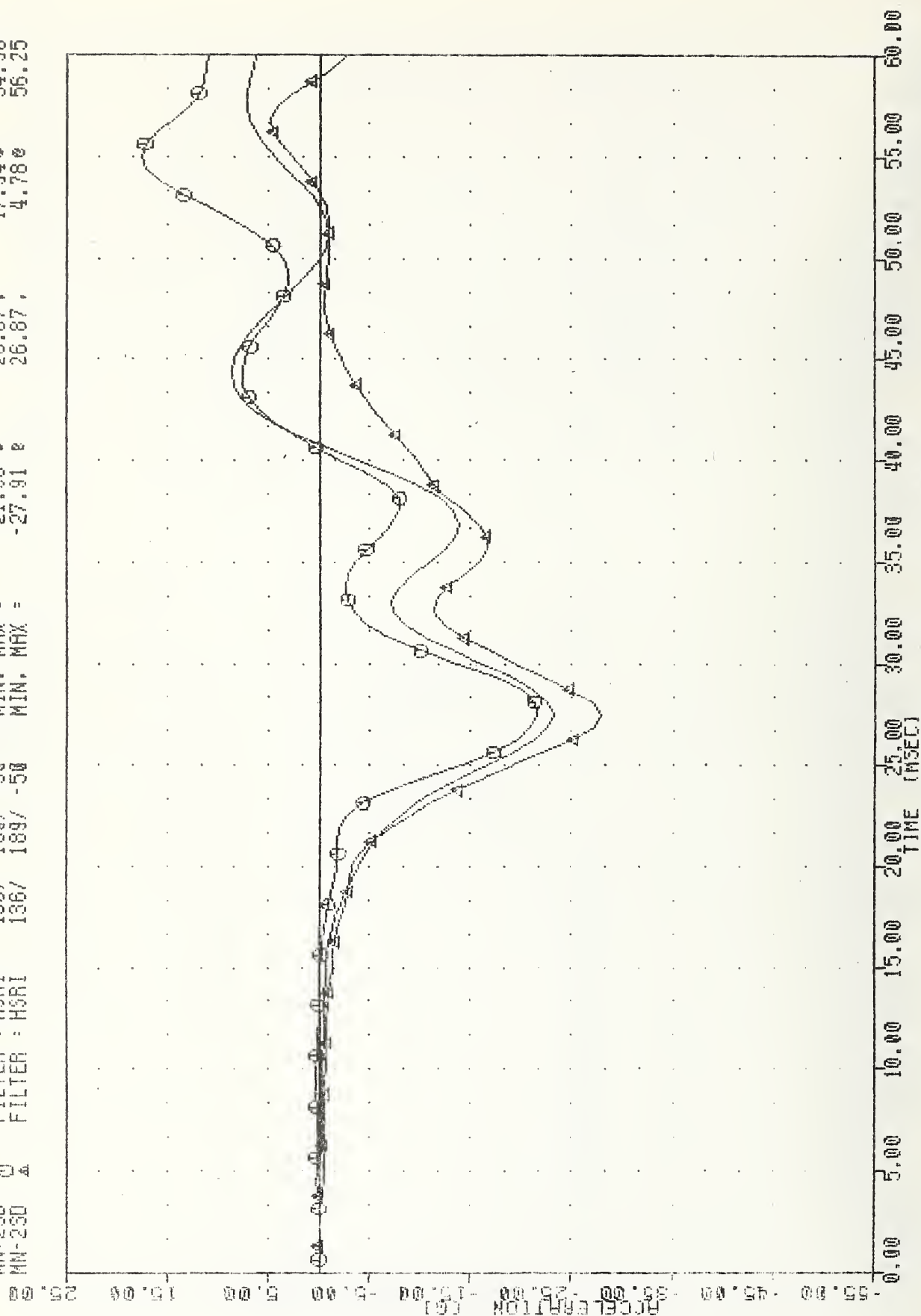
T12Y61	FILTER = HSRI	136/	189/	-50	MIN. MAX =	-22.18	25.63	9.93	56.87
MN-2SD	FILTER = HSRI	136/	189/	-50	MIN. MAX =	-22.37	25.63	13.54	53.75
MN-2SD	FILTER = HSRI	136/	189/	-50	MIN. MAX =	-25.84	25.63	4.85	53.75



VRIC SRL26 .ARLSCA67 SID THORAX 6 BODY 318 CAL 67 83290 PLOT DATE 17-OCT-83 16:02:40
 T12YGA FILTER = HSRI 136/ 189/ -50 MIN, MAX = -22.02 8 25.63, 9.60 2 56.87
 MN-250 0 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -22.37 9 25.63, 13.54 0 53.75
 MN-250 A FILTER = HSRI 136/ 189/ -50 MIN, MAX = -25.84 2 25.63, 4.85 0 53.75

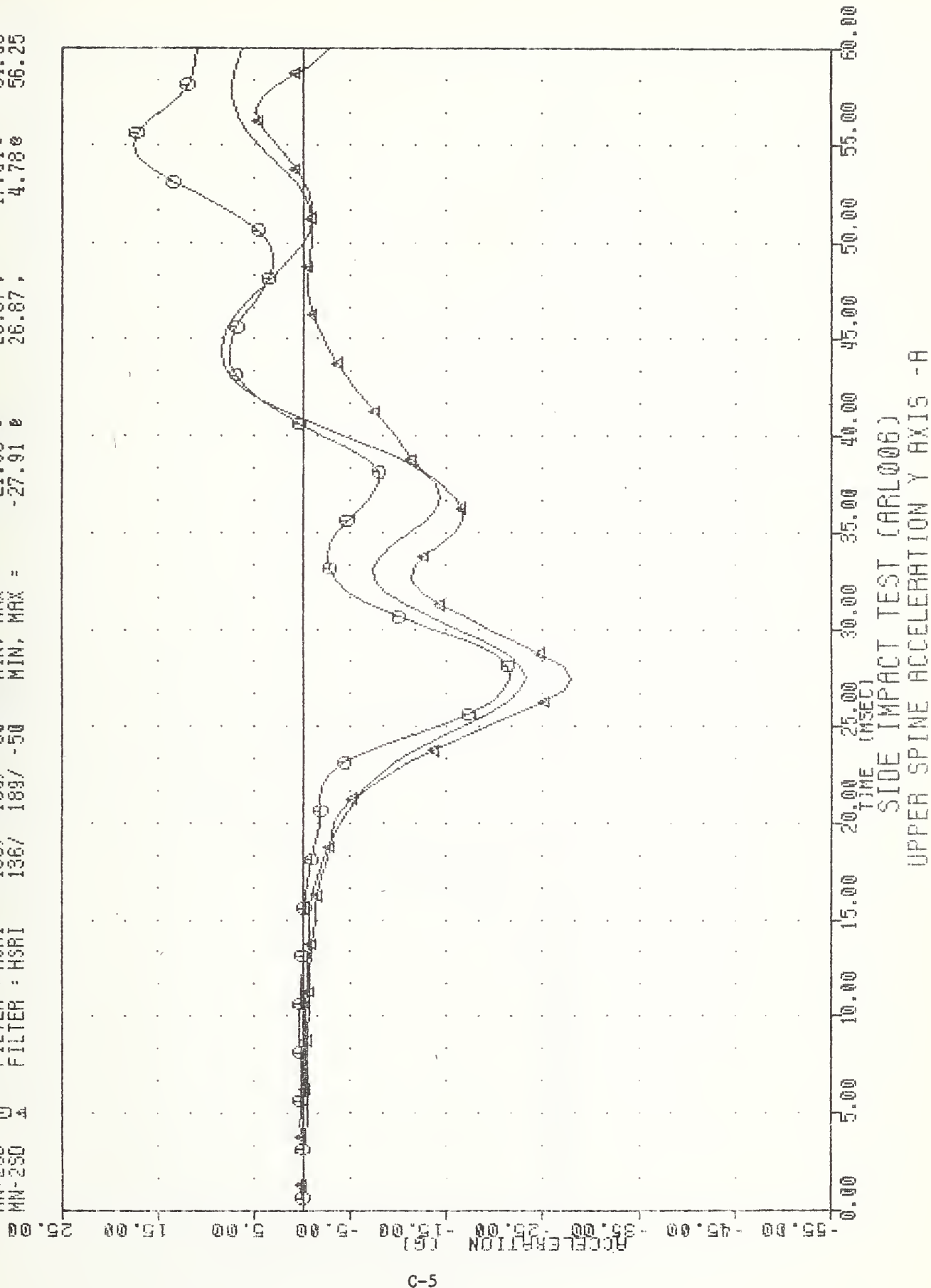


VRIC SRL26 , ARLECR67 S10 THORAX 6 BODY 318 CAL 87 83290 PLOT DATE 17-OCT-83 16:09:35
 TOIY61 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -23.12 8.59e 43.75
 MN+2SD 0 FILTER : HSRI 136/ 189/ -50 MIN. MAX = -21.58 17.54e 54.38
 MN-2SD A FILTER : HSRI 136/ 189/ -50 MIN. MAX = -27.91 4.78e 56.25



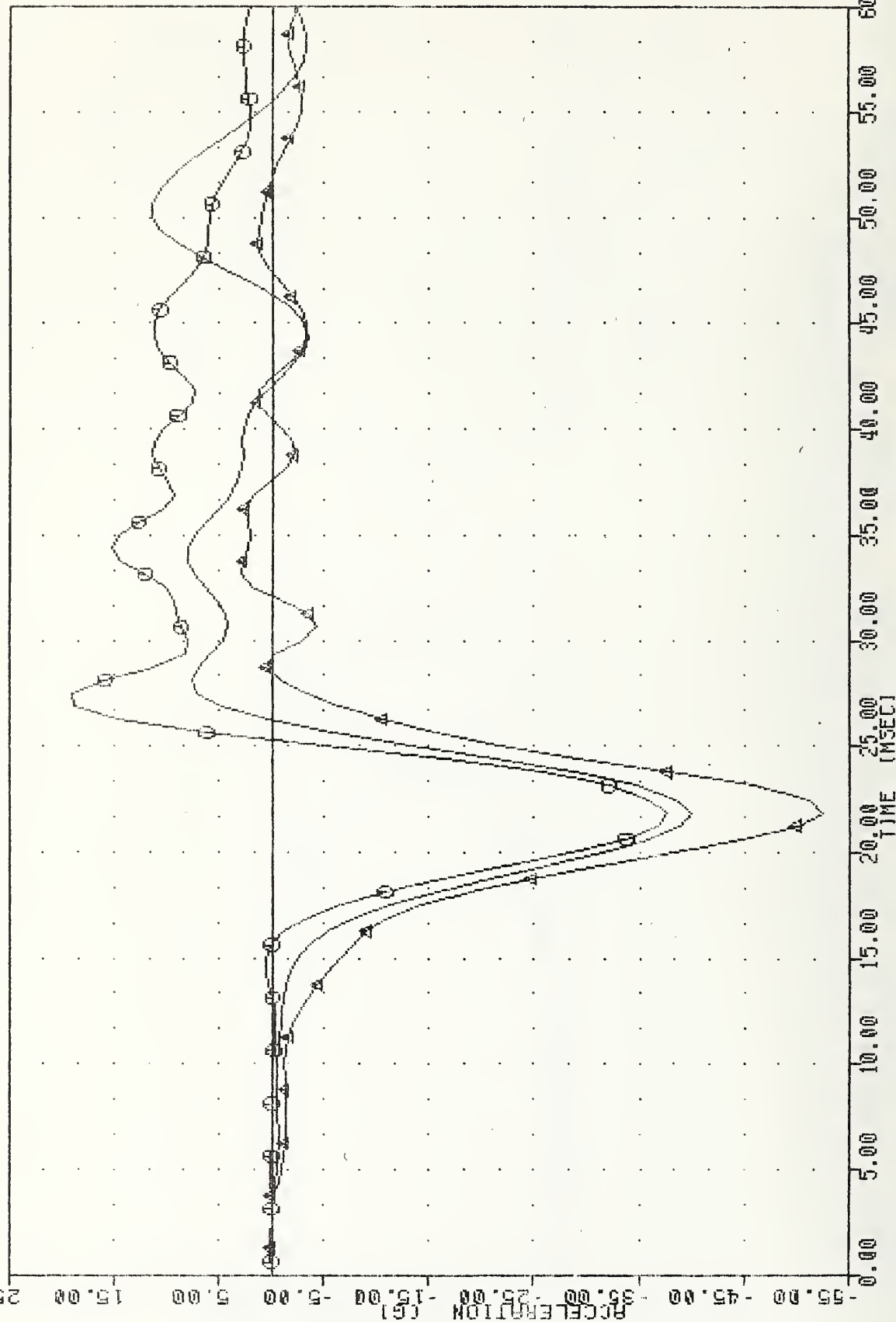
SIDE IMPACT TEST (ARL006)
 UPPER SPINE ACCELERATION Y AXIS -1

VRIC SRL26 , SRL6CR67 SID THORAX 6 BODY 318 CAL 67 83290 17-OCT-83 16:11:23
 T01YGR FILTER : HSRI 136/ 189/ -50 MIN, MAX = -23.16 8.46 43.75
 MN-250 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -21.58 17.54 54.38
 MN-250 4 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -27.91 26.87 56.25



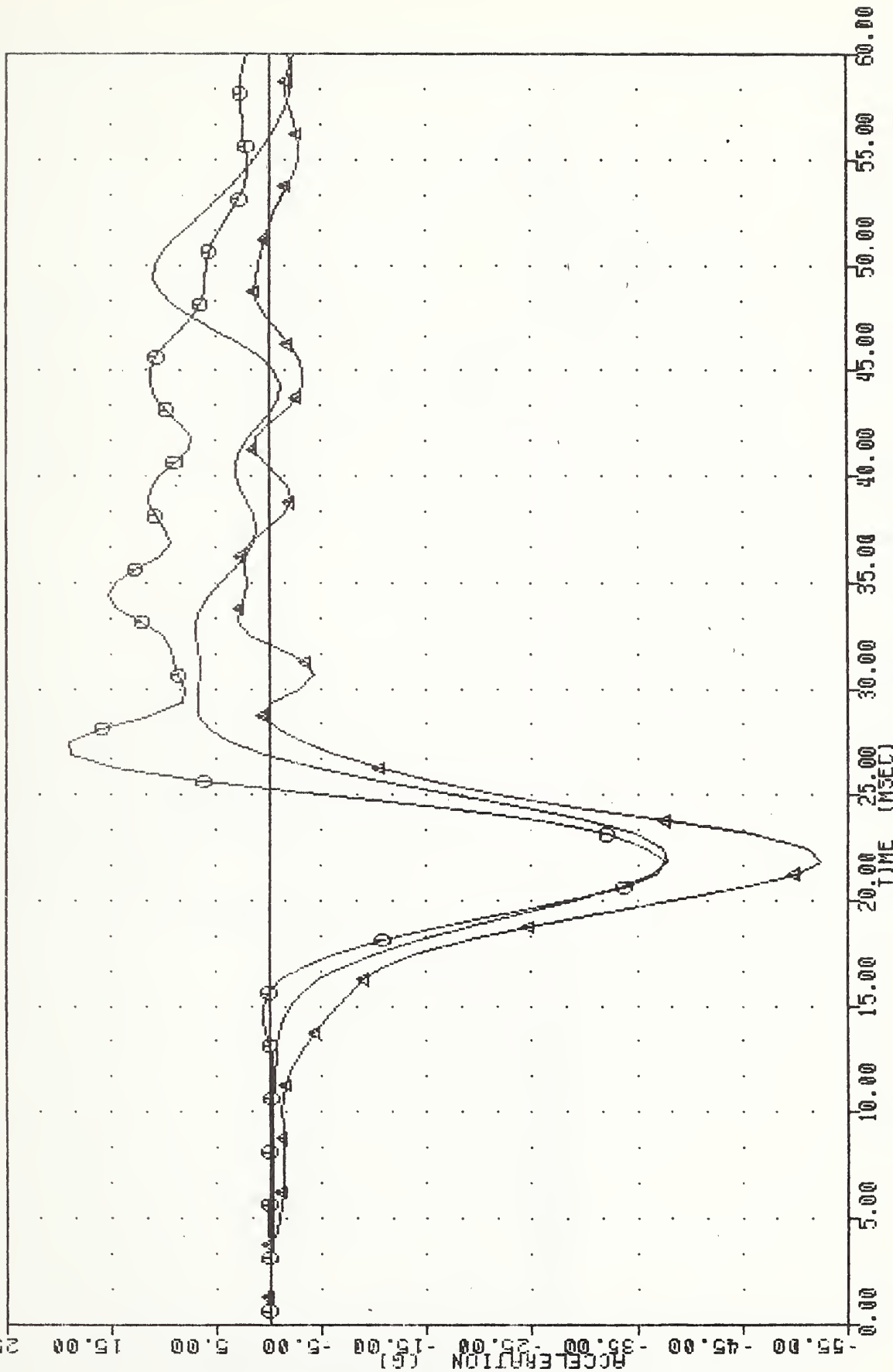
SIDE IMPACT TEST (ARL006)
 UPPER SPINE ACCELERATION Y AXIS -A

VRIC SRL26 , ARL6C867 SID THORAX 6 BODY 318 CAL 67 83290 PLOT DATE 17-OCT-83 16:05:34
 LLRY6A FILTER : HSRI 136/ 189/ -50 MIN, MAX = -39.88 21.25, 11.39 50.00
 MN-2SD 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -37.66 21.25, 19.00 26.87
 MN-2SD A FILTER : HSRI 136/ 189/ -50 MIN, MAX = -52.52 21.25, 2.94 32.50



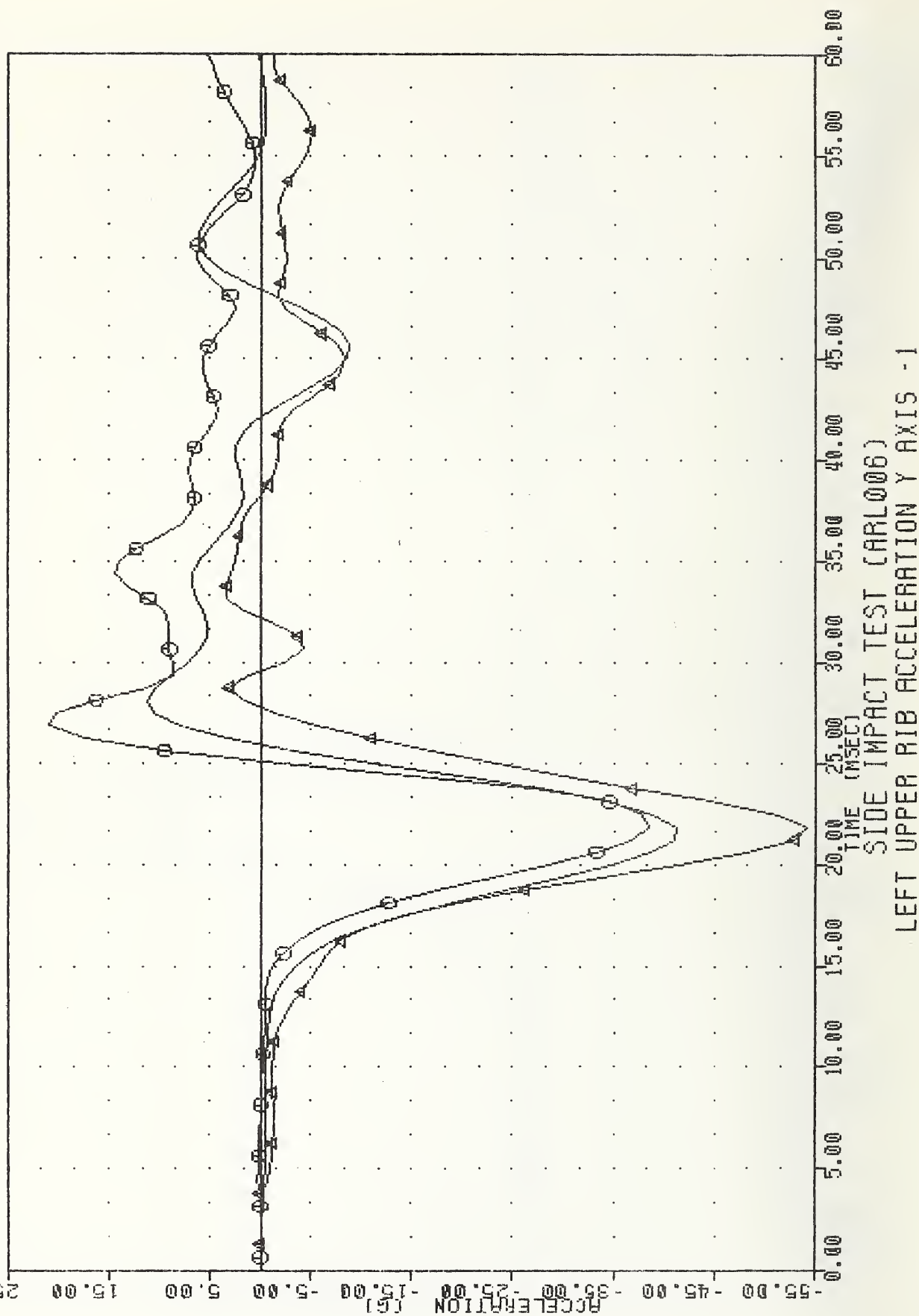
SIDE IMPACT TEST (ARL006)
 LEFT LOWER RIB ACCELERATION Y AXIS - A

VRTC SRL26 , ARL6CA67 SID THORAX 6 BODY 318 CAL 67 83290 PLOT DATE 17-UL1-83 16:04:11
 LLRY61 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -37.87 0 21.25 10.92 48.75
 MN-250 0 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -37.86 0 21.25 19.00 26.87
 MN-250 4 FILTER : HSRI 136/ 189/ -50 MIN, MAX = -52.52 0 21.25 2.94 32.50

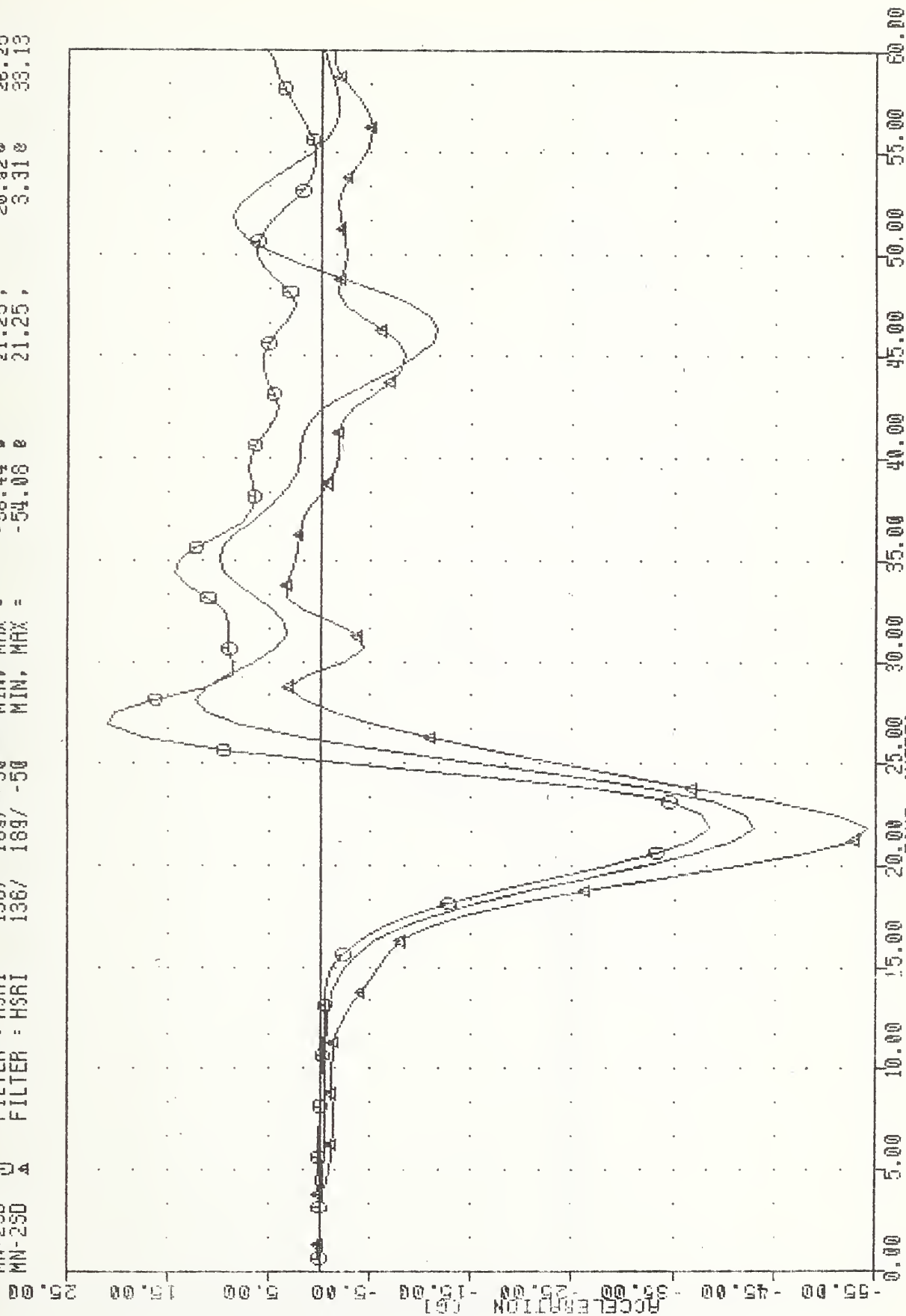


SIDE IMPACT TEST (ARL006)
 LEFT LOWER RIB ACCELERATION Y AXIS -1

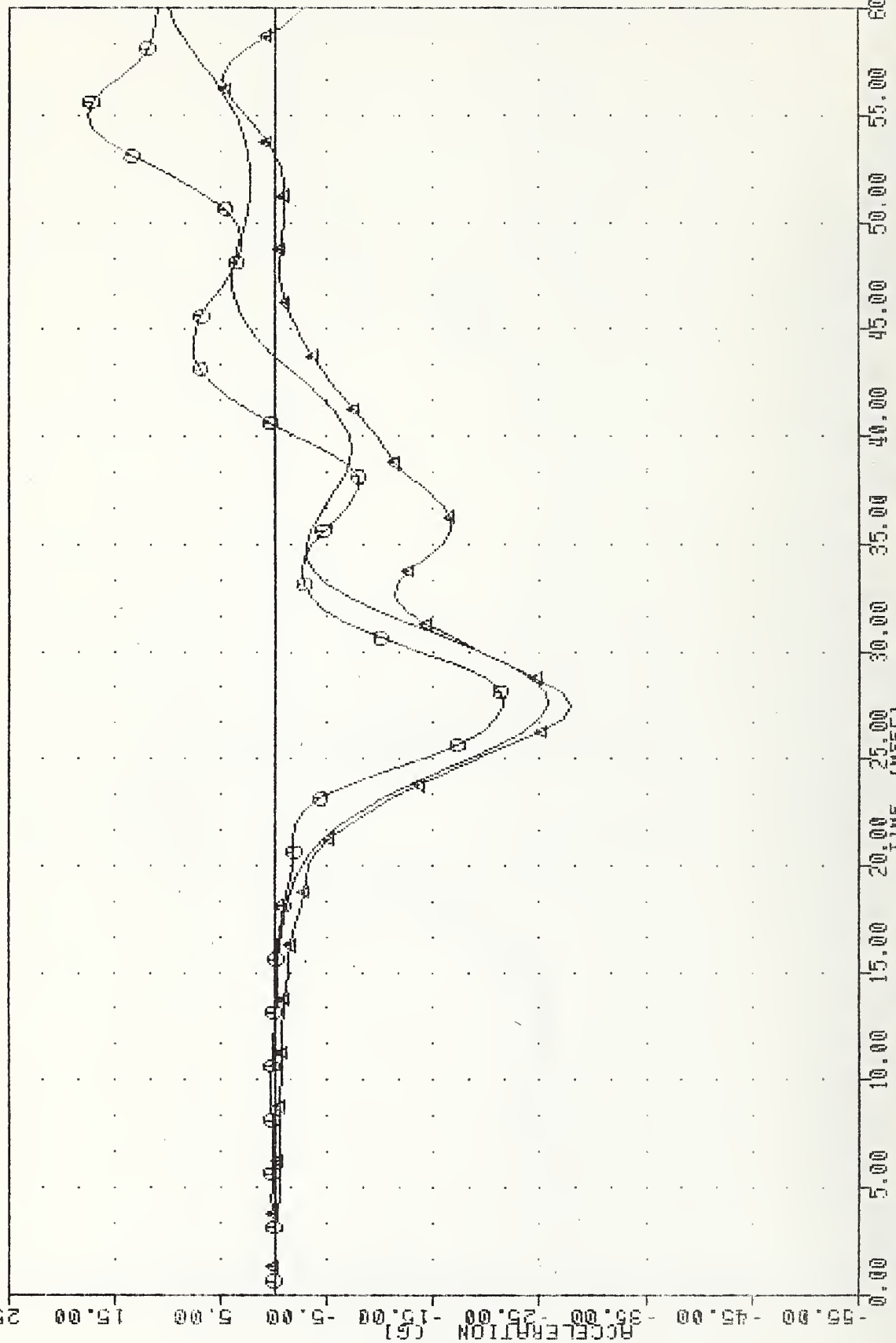
VRIC SRL26 , ARL6CA67 SID THORAX 6 BODY 318 CAL 67 83290 PLOT DATE 17-OCT-83 16:13:15
 LURYGI FILTER = HSRI 136/ 189/ -50 MIN, MAX = -41.18 11.12 27.50
 MN-250 0 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -38.44 20.92 26.25
 MN-250 4 FILTER = HSRI 136/ 189/ -50 MIN, MAX = -54.08 3.91 33.13



VRTC SRL26 , ARL6CA67 SID THORAX 6 BODY 318 CAL 67 83290 PLOT DATE 17-OCT-83 16:07:46
 LURYGA FILTER = HSRI 136/ 189/ -50 MIN, MAX = -42.86 21.25, 12.21 27.50
 MN-250 U FILTER = HSRI 136/ 189/ -50 MIN, MAX = -38.44 21.25, 20.92 26.25
 MN-250 A FILTER = HSRI 136/ 189/ -50 MIN, MAX = -54.08 21.25, 3.31 33.13

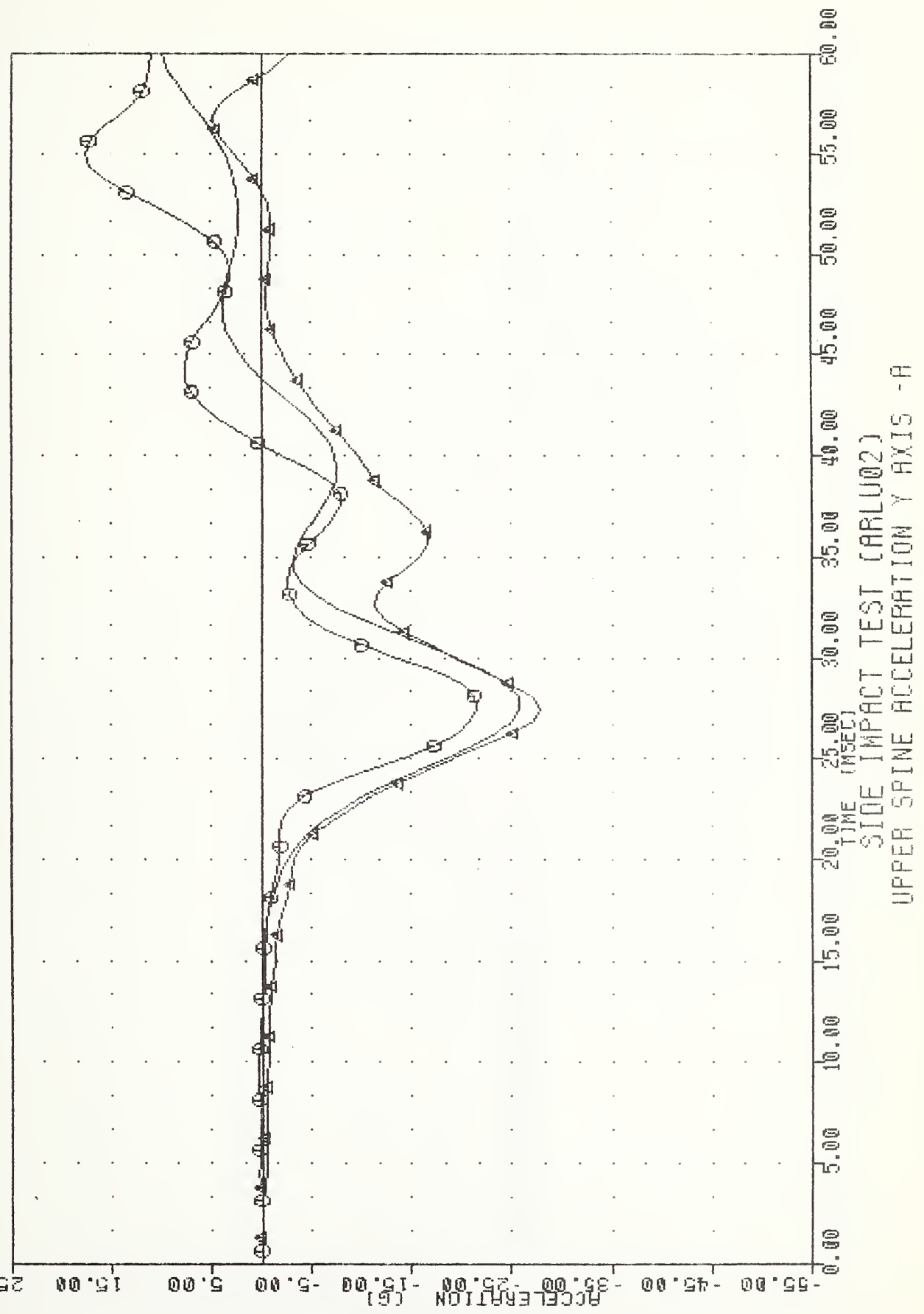


TO1Y61	FILTER = HSRI	136/	189/	-50	MIN, MAX =	-25.72	26.87	10.02	60.00
MN-250	FILTER = HSRI	136/	189/	-50	MIN, MAX =	-21.58	26.87	17.54	54.38
MN-250	FILTER = HSRI	136/	189/	-50	MIN, MAX =	-27.91	26.87	4.78	56.25

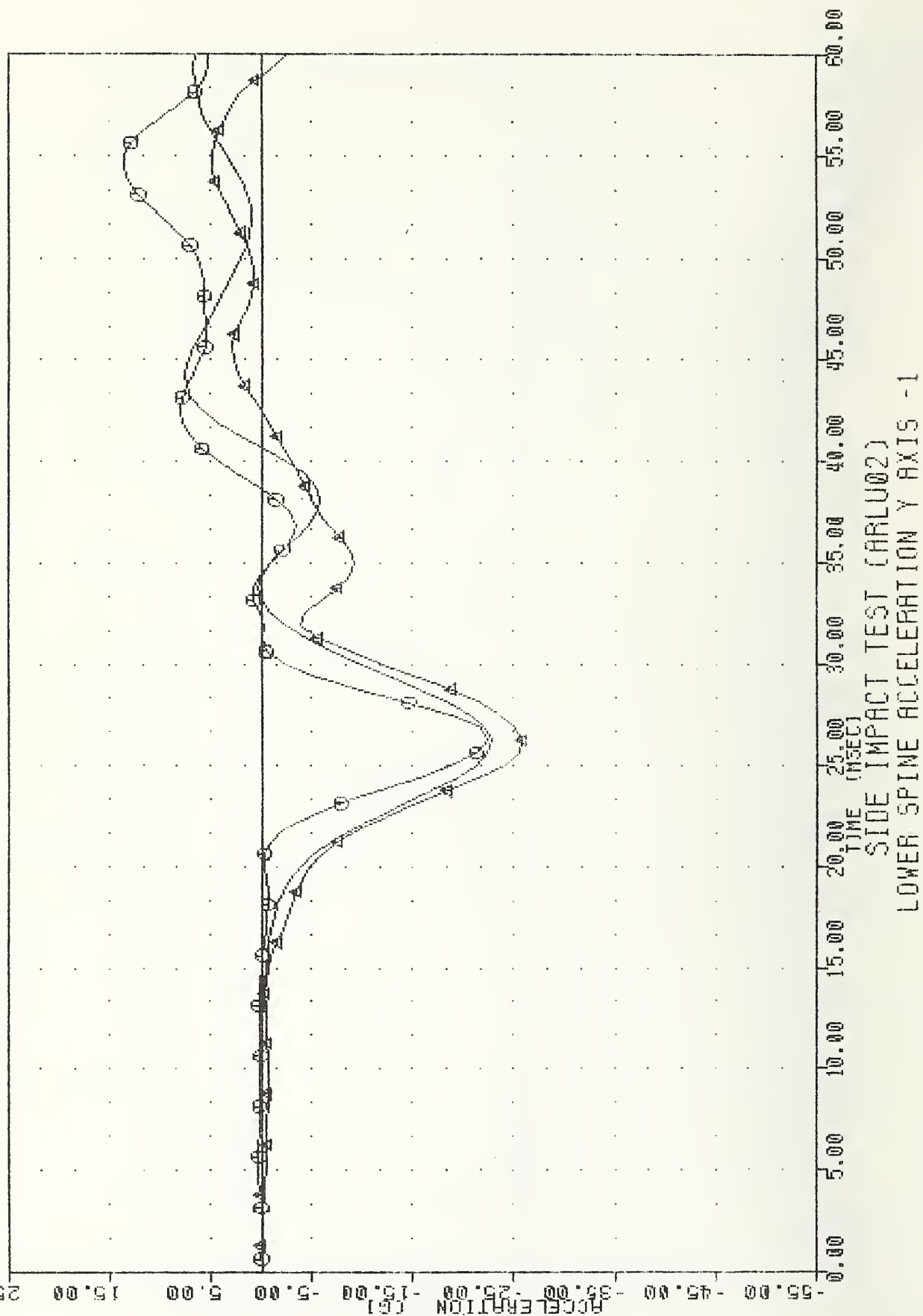


SIDE IMPACT TEST (CARLU02)
UPPER SPINE ACCELERATION Y AXIS -1

TOIYGR		FILTER = HSRI	136/	189/	-50	MIN. MAX =	-25.87	0	26.87	10.03	0	60.00
MN-250	0	FILTER = HSRI	136/	189/	-50	MIN. MAX =	-21.58	0	26.87	17.54	0	54.32
MN-250	Δ	FILTER = HSRI	136/	189/	-50	MIN. MAX =	-27.91	0	26.87	4.78	0	56.25



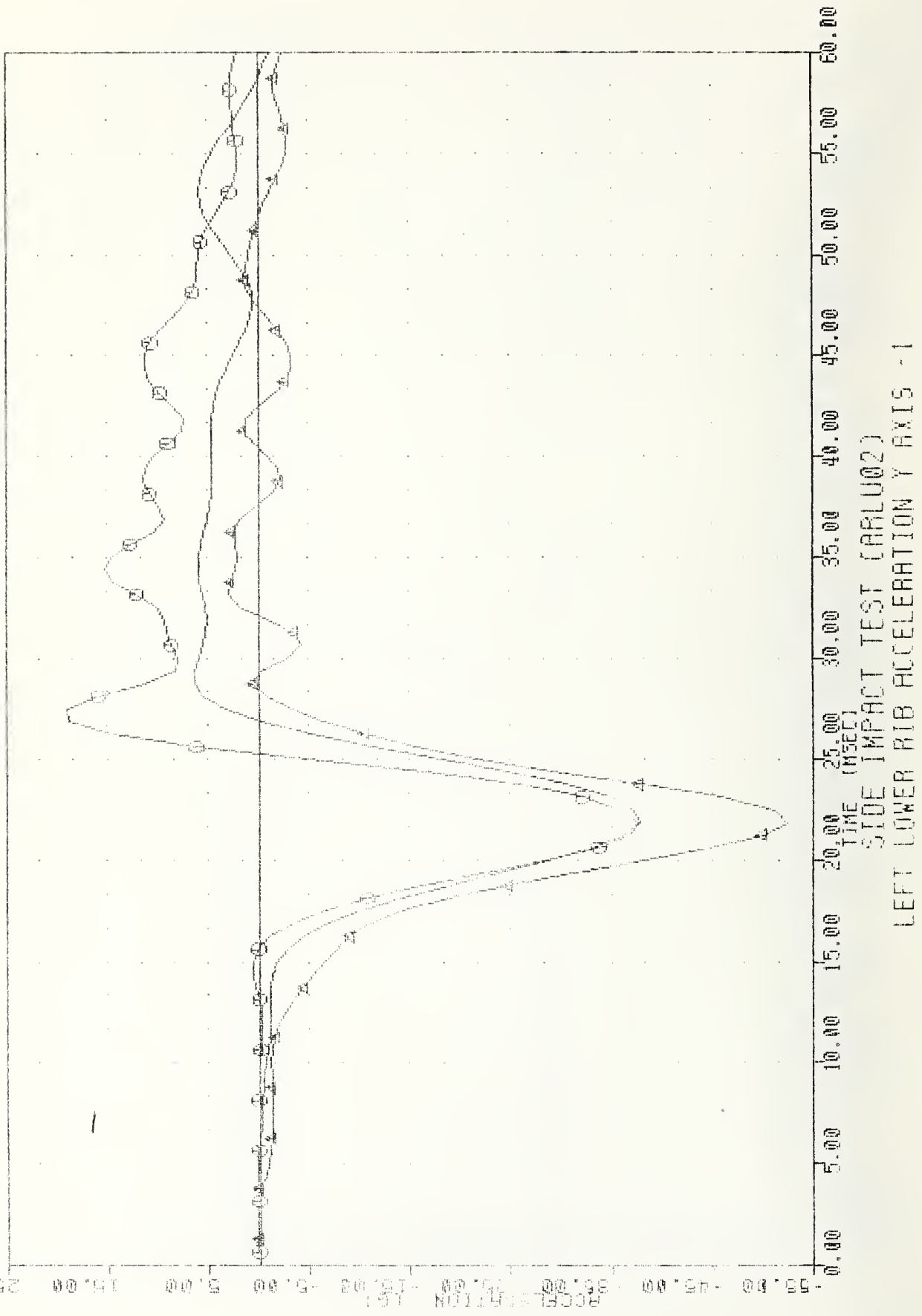
T12Y61	FILTER : HSRI	136/	189/	-50	MIN. MAX =	-22.75	25.63	7.45	43.75
MN-230	FILTER : HSRI	136/	189/	-50	MIN. MAX =	-22.37	25.63	13.54	53.75
MN-230	FILTER : HSRI	136/	189/	-50	MIN. MAX =	-25.84	25.63	4.85	53.75

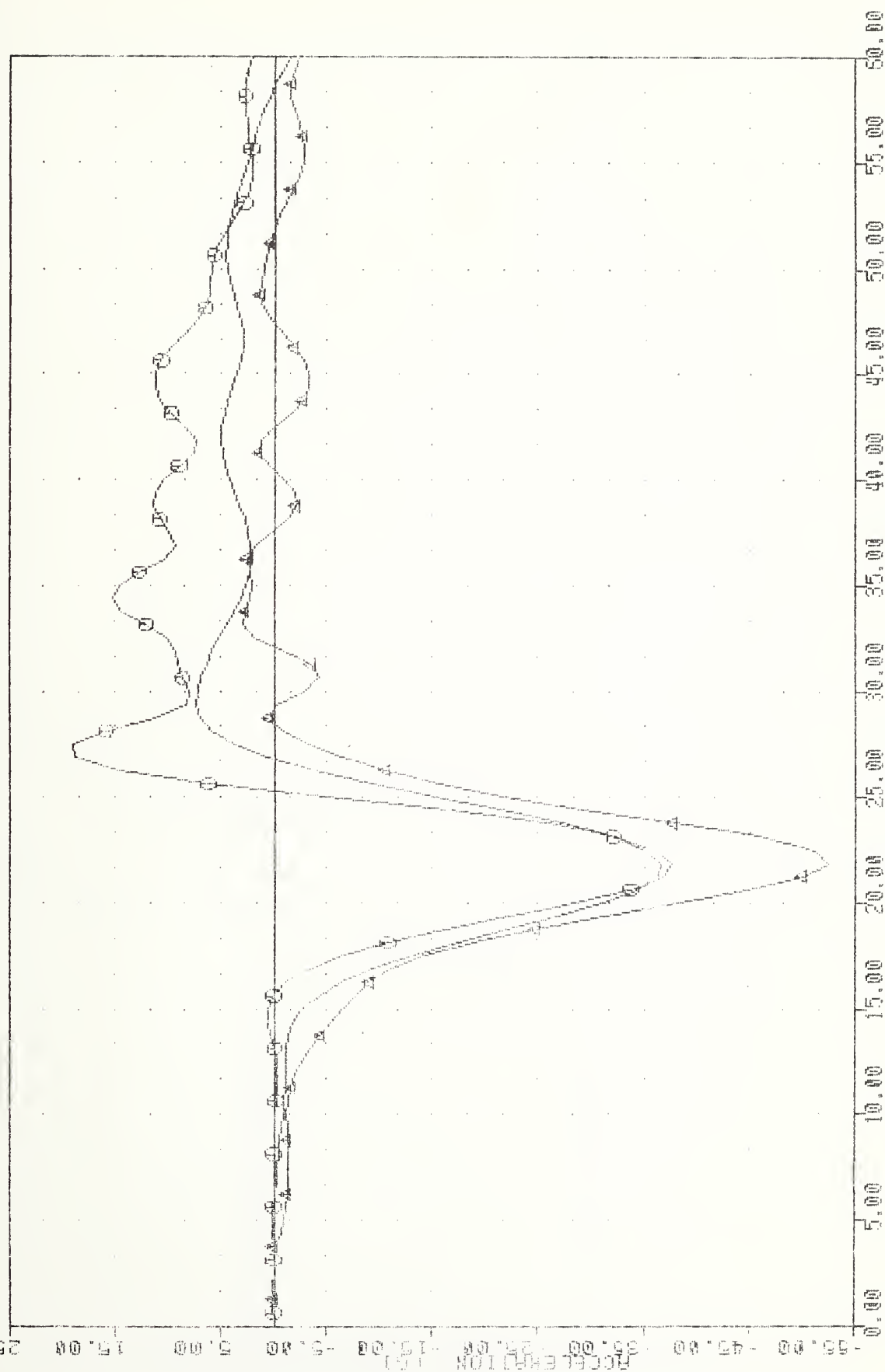


09 08 07
08 07 06
07 06 05
06 05 04
05 04 03
04 03 02
03 02 01

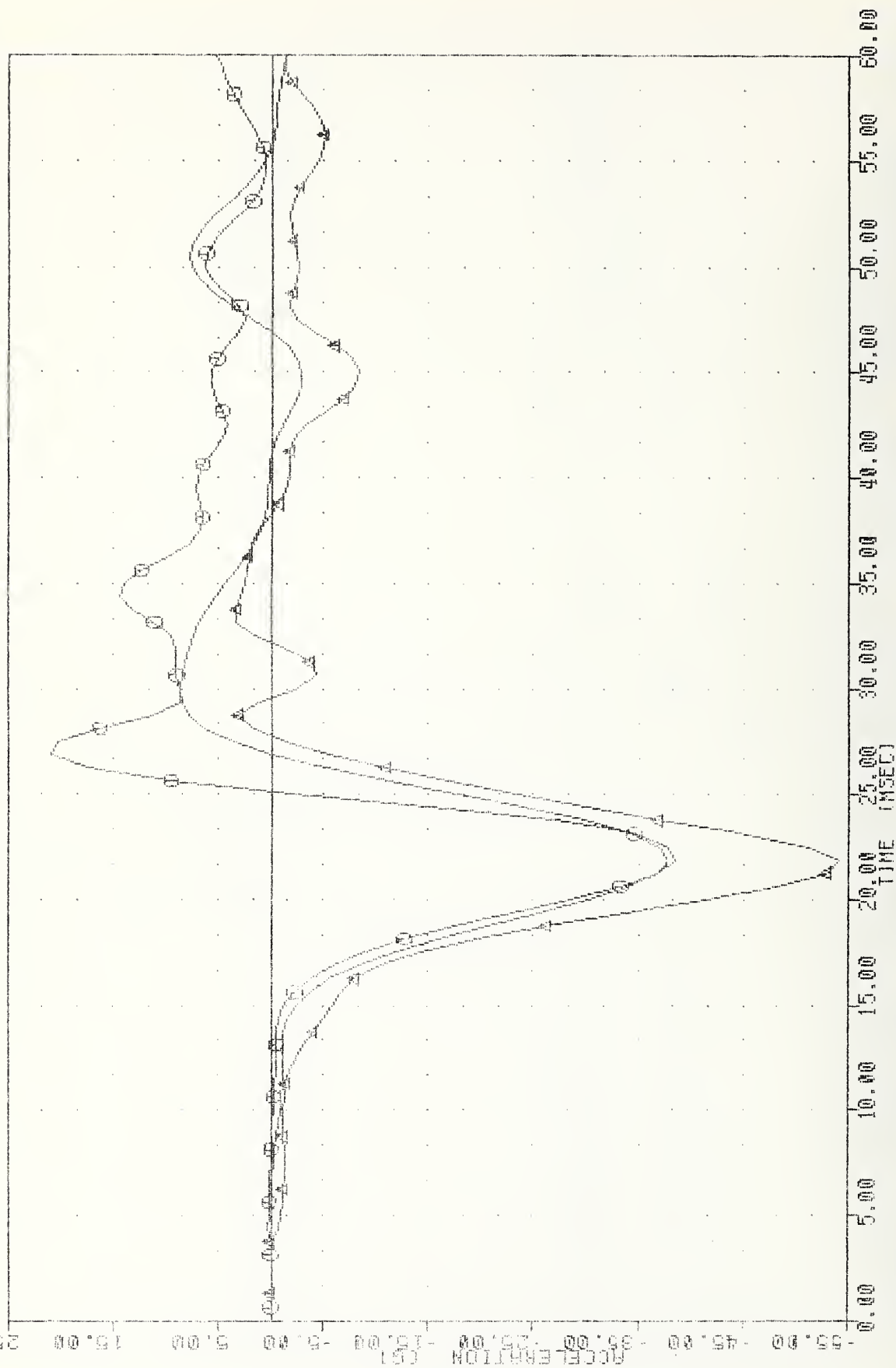


DATA	136/	189/	50	MIN	MAX	2	-37.75	0	21.25	6.32	28.75
MIN-2SD	136/	189/	-50	MIN	MAX		-37.66	0	21.25	10.00	26.87
MIN-2SD	136/	189/	-50	MIN	MAX		-52.52	0	21.25	2.94	32.50



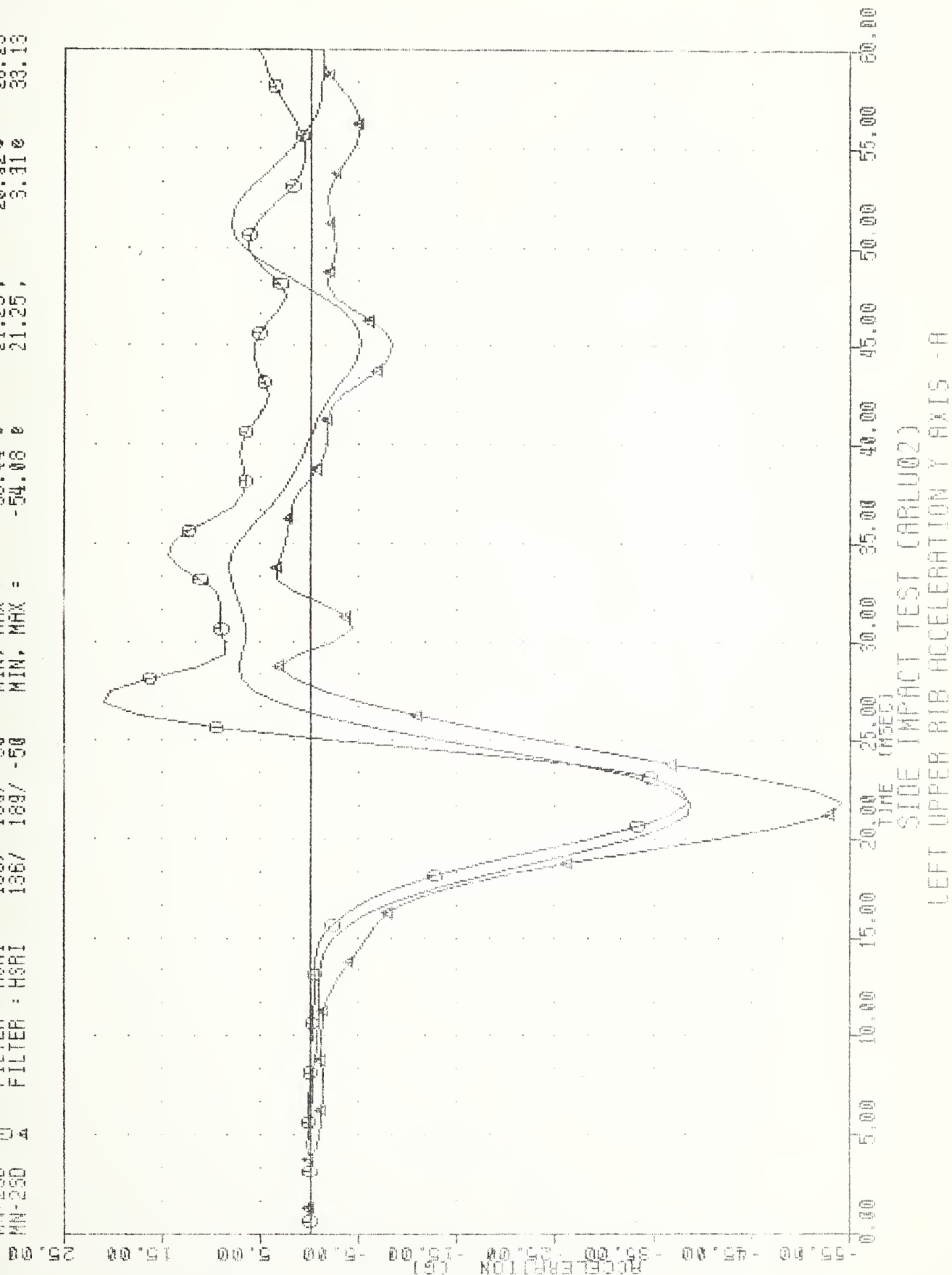
[illegible]

LEFT LOWER RIB ACCELERATION Y AXIS - A

[illegible]

LINE (CASEC)
SIDE IMPACT TEST (CARLUQ2)
LEFT UPPER RIB ACCELERATION Y AXIS - 1

FILED 00120	0	136/	189/	50	MIN. MAX =	-38.74	0	21.25	8.14	0	33.13
LURYGA	0	136/	189/	50	MIN. MAX =	-38.44	0	21.25	20.92	0	33.13
MN-250	0	136/	189/	50	MIN. MAX =	-54.08	0	21.25	3.31	0	33.13
MN-250	0	136/	189/	50	MIN. MAX =						



TL 242 • S88

Stultz, J.

MDB-to-car si
of a 19j cre

Form DOT F 1720.2 (8)
FORMERLY FORM DOT F 1700

